

Chemical Week

March 22, 1958

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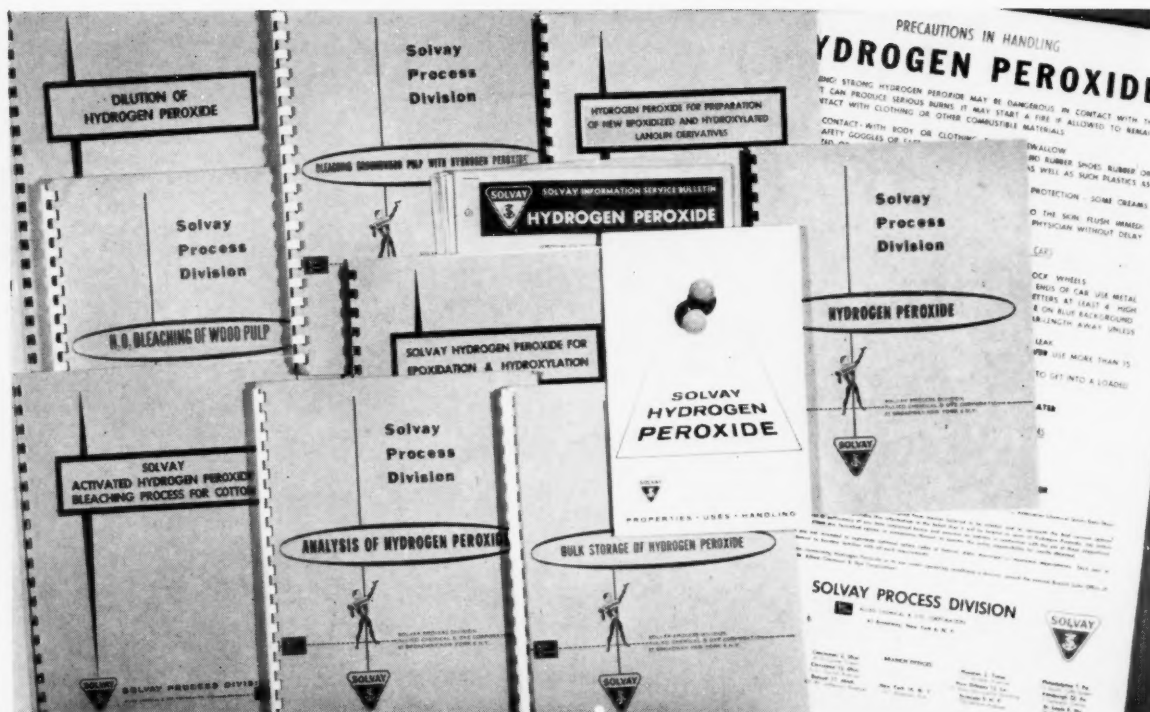
Preparing for a long-term boom,
CPI aims expansion plans beyond
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need for effective eye-safety pro-
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typifies medium-size German
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Random balance: fast-working new
weapon for production trouble-
shooters p. 79



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HP-7—Hydrogen Peroxide Bleaching of Groundwood Pulp: Chemicals used, analytical methods, bleaching operations. 15 pages.

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HP-14—Solvay Activated Hydrogen Peroxide Bleaching Process for Cotton: Process description, operation details, commercial applications, cost and quality comparison. 7 pages.

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NO. 8-1057—Information Service Bulletin: Directions for unloading tank cars of hydrogen peroxide.

NO. 6-56—Information Service Bulletin: Hydrogen peroxide in oxidation of vat dyes.

NO. 2-57—Information Service Bulletin: Hydrogen peroxide in finishing electroplated surfaces.

NO. 6-657—Information Service Bulletin: Hydrogen peroxide in foam rubber manufacture.

NO. 4-57—Information Service Bulletin: Hydrogen peroxide in shellac bleaching.

NO. 7-957 and NO. 9-1157—Information Service Bulletins: Hydrogen peroxide in wood bleaching.



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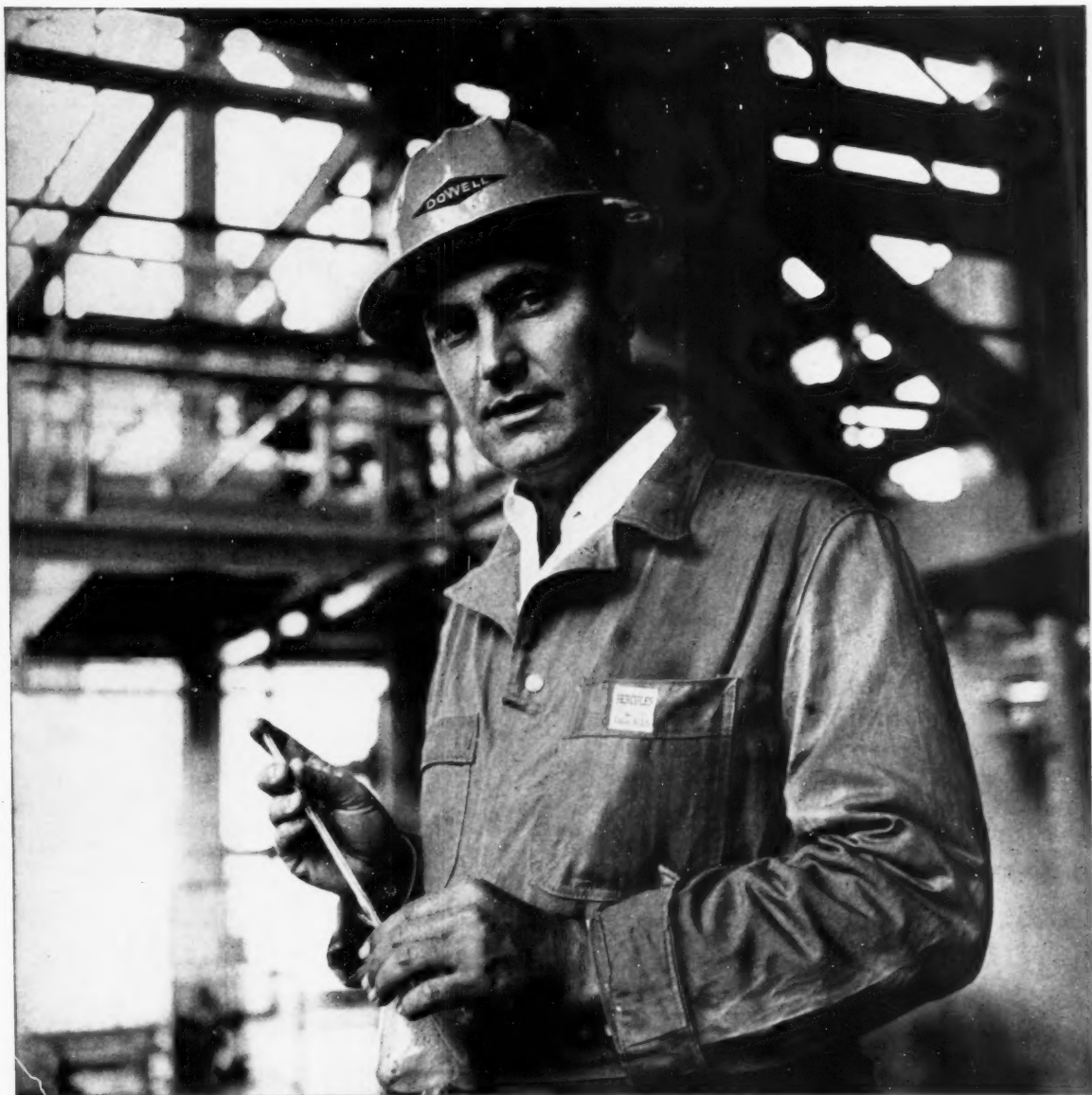
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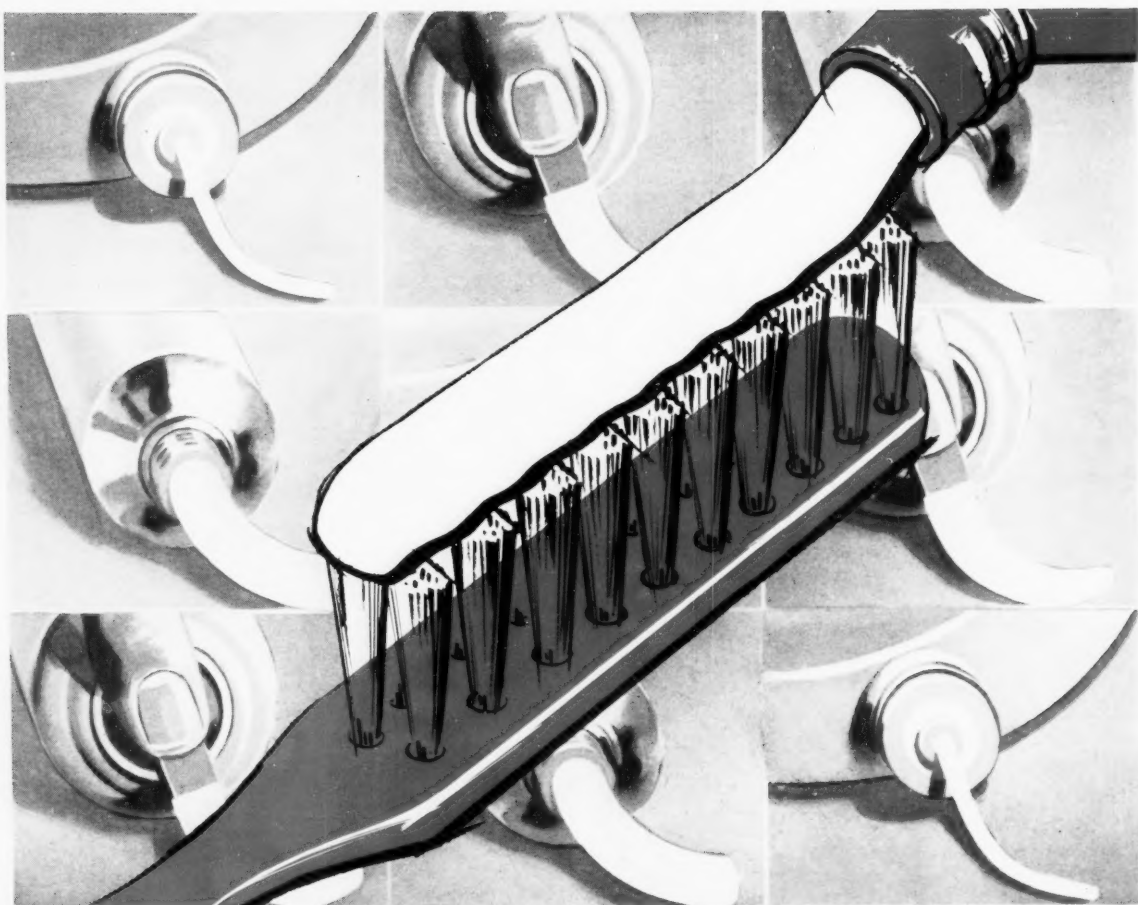
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TOP OF THE WEEK

March 22, 1958

- ▶ **Drugmaker raps New Jersey's "business-discouraging" taxes,** says they may force CPI to build elsewherep. 22
- ▶ **Hard, flexible, extra-fine-grain nickel** may have application in process equipment manufacturep. 29
- ▶ **Union Carbide's water-based hydraulic fluid** bids for use in airline equipmentp. 53
- ▶ **Stronger competition from Italy in the export market?** It's sure to come, say U.S. chemical marketers.p. 73

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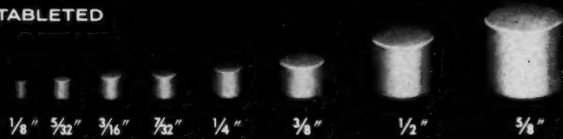
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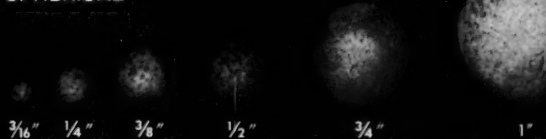
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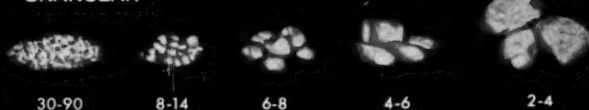
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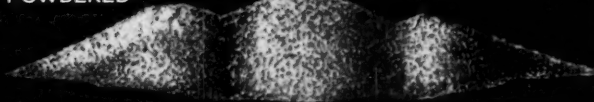
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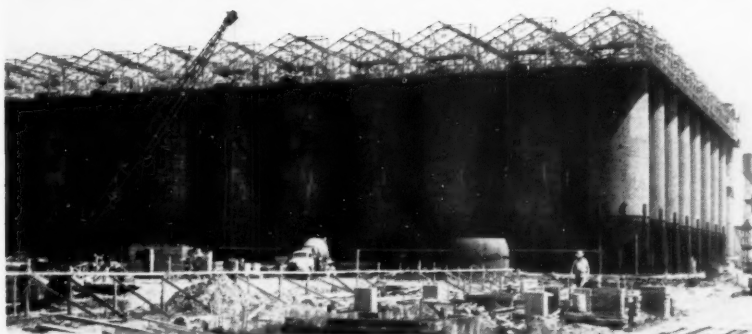
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What it takes to build a new word

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petroleum raw materials and refinery by-products. Today UOP makes available to all refiners a number of petrochemical processes. These provide chemicals for the synthetics which have become part of our daily lives through their application to so many products now essential to our standard of living. Too, they help improve the economic efficiency of petroleum refining. UOP will be glad to supply, without obligation, individual recommendations for the practical application of its various petrochemical processes to any refining operation, anywhere in the free world.



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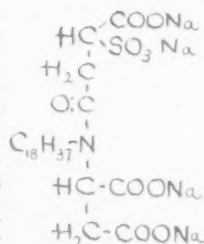
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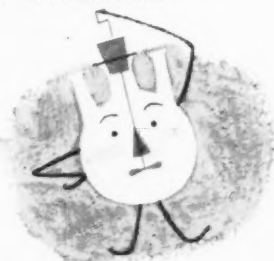
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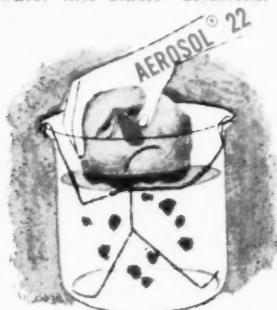
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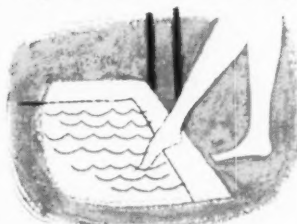
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Fig. 2456SG—Large Stainless Steel O.S. & Y. Gate Valve for 150 pounds W.P. End flanges have 1/16" raised face, and conform to ASA B16.5 Standard.

Fig. 2337—Small Stainless Steel Gate Valve for 200 pounds W.P. Screwed-in Bonnet, inside screw non-rising stem, solid wedge disc. Dimension of flanged end valves conform to latest standards.

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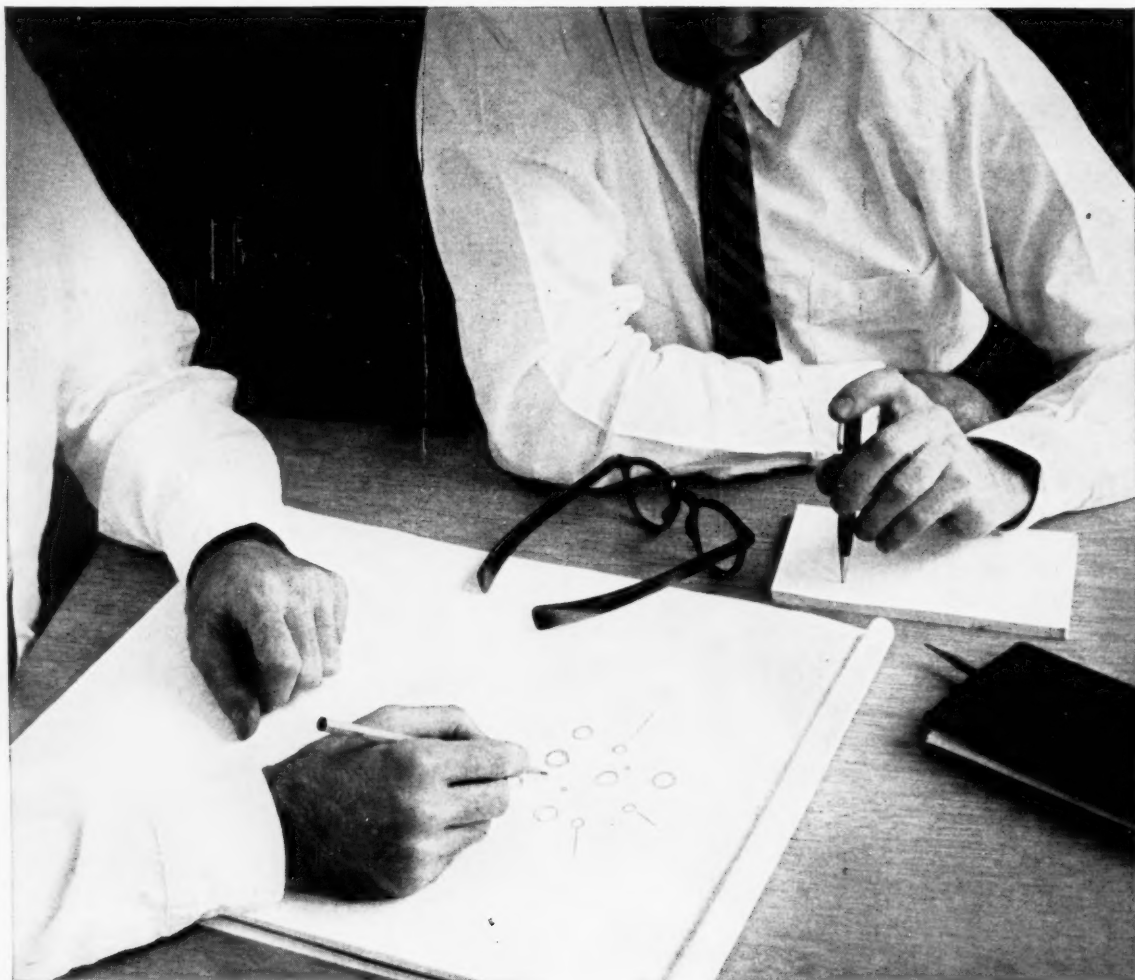
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Inland Port?

TO THE EDITOR: I enjoyed your article "Chemical Makers Move Into Connecticut" (March 1).

I especially enjoyed studying the map of Connecticut. . . . However, I suspect it will come as something of a shock to the Coast Guard to find New London has moved to the center of the state—especially when they try to navigate to their base in that "port."

The New Haven Railroad commuters will, no doubt, be equally surprised to find they now live on the water. Doesn't the poor commuter have enough problems as it is?

H. C. HEASLIP
 Asst. Advertising Manager
 The Lummus Co.
 New York

A cluck of sympathy for the poor commuter and a slap on the wrist for our mixed-up mapmaker.—Ed.

CPI in Connecticut

TO THE EDITOR: . . . All of us in Connecticut feel certain that the Turnpike will aid the further development of business and industry in the state.

ABRAHAM RIBICOFF
 Governor
 State of Connecticut
 Hartford

MEETINGS

Society of the Plastics Industry, 15th annual Pacific Coast section conference, El Mirador Hotel, Palm Springs, Calif., March 26-28.

Commercial Chemical Development Assn.; theme: commercial impact of synthetic rubber; Statler Hotel, New York, March 27.

American Management Assn.; discussion: private and governmental sources of financial aid for U.S. companies doing business abroad; Sheraton-Astor Hotel, New York, March 31-April 2.

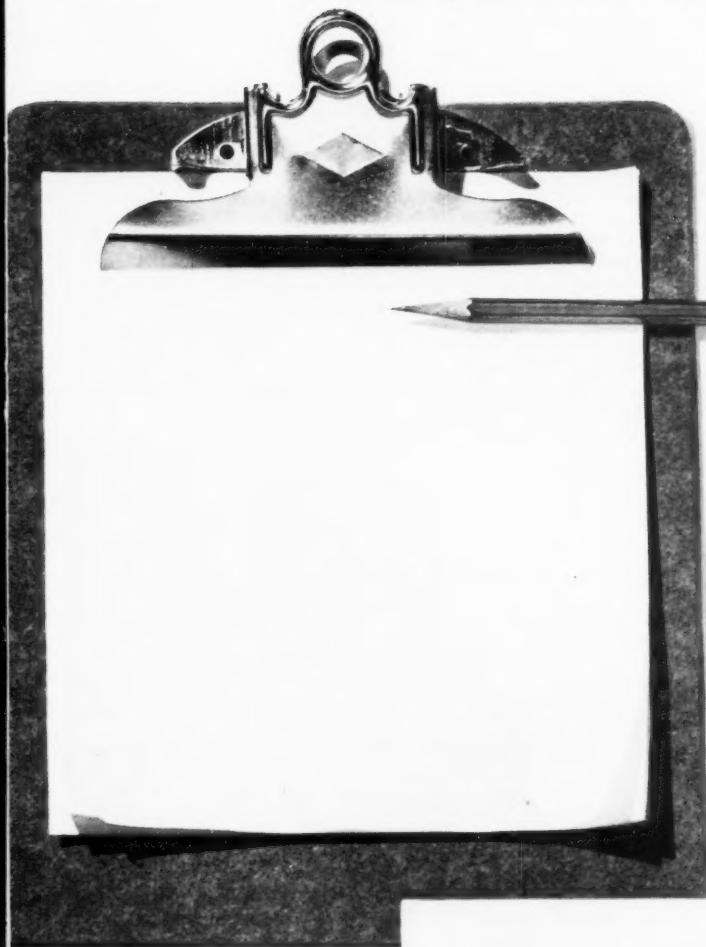
American Chemical Society, California section, chemical exposition, Civic Center Exhibit Hall, San Francisco, April 13-17.

American Institute of Mining, Metallurgical and Petroleum Engineers, Metallurgical Society's 41st annual national open hearth steel conference, Statler Hotel, Cleveland, April 14-16.

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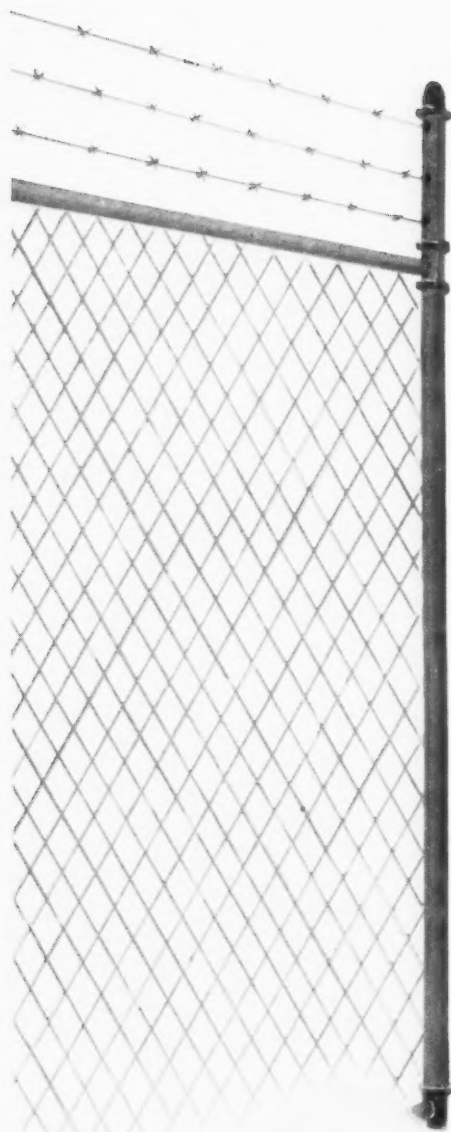
Typical Inspection Data

PANASOL Solvent Number	AN-1	AN-2K	AN-3	AN-5
IBP, °F.	400	398	450	450
10%, °F.	424	440	466	464
50%, °F.	444	466	476	485
90%, °F.	468	490	500	555
FBP, °F.	494	525	534	720
Specific Gravity, 60/60 °F.	0.974	0.950	0.997	1.01
DDT Solubility (at 32 °F., Wt. %)	39	35	42	—

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Business Newsletter

CHEMICAL WEEK

March 22, 1958

U.S. aluminum industry is going ahead with expansion and modernization, despite setbacks here and abroad. Next month (about April 10), Aluminum Co. of America will offer \$125 million in sinking fund debentures for sale to the public. Part of the proceeds will go to pay off bank loans incurred for earlier expansions; the rest will be used for new construction.

In deciding to go ahead with expansion plans, Alcoa felt that the steadying stock market and generally bright long-term outlook for aluminum helped outweigh such factors as the growing competition overseas from Russia (*p. 23*) and scattered cutbacks in this country. Latest production cut: Kaiser's decision early this week to slice aluminum output to 80% of capacity by curtailing its Mead and Tacoma, Wash., plants.

In all, Alcoa has budgeted \$600 million for new plants and equipment, with \$447 million to be spent in the three-year period ending this December.

•
And chemical expansion is continuing, too. Latest projects:

- Du Pont has started building a Teflon fluorocarbon resin plant at its Washington works near Parkersburg, W. Va. This unit—the second major expansion there in the past six months—is expected in commercial production by mid-'59.

- Pennsalt Chemicals is further increasing its hydrofluoric acid capacity at Calvert City, Ky. Company President William Drake says this new expansion will cost several million dollars, enable Pennsalt “to take care of both its own captive requirements, present and anticipated, as well as any foreseeable demand from its HF customers.”

•
There is, nonetheless, a slowdown in plant expansions, to judge from reports of plant construction and equipment makers. And—in seeming contrast with government observers (*see p. 21*)—they are not expecting a big pickup in expansion of chemical process operations during '58.

- Fluor Corp. (Los Angeles) says its sales for the three months ending Jan. 31 were \$30.6 million, compared with \$35.3 million in the corresponding period a year ago. New orders received in this year's first quarter totaled \$28 million; the comparable '57 figure was \$53 million. Backlog of uncompleted work was down—from \$140 million to about \$135 million. President J. S. Fluor says it now appears that the company's '58 earnings will be off more than the 15% predicted earlier; but that the long-range outlook is as promising as ever.

- Dresser Industries (Dallas) reports first-quarter sales of \$58.4 million, compared with \$63.2 million in first-quarter '57. Management expects '58 sales to be below last year's record level, but higher than in any

Business

Newsletter

(Continued)

year before that. Also, Dresser is looking for an increase in business following an upturn in petroleum industry activity after the middle of this year.

- Foster Wheeler (New York) is not optimistic about '58 operations but is confident that when there's a new wave of expansion and modernization in chemical and other industries "we will continue to get our share of this business." This company lost nearly \$3.4 million on its U.S. business last year, but earnings of its foreign subsidiaries—"from good to excellent"—made the net loss for the corporation as a whole only \$0.8 million. Backlog declined from \$327 million at the start of the year to about \$313 million Dec. 31.

Other '57 earnings reported this week:

Aluminum Co. of America had sales of \$869.4 million, up 6%. But its profits skidded to \$75.6 million—15% lower than in '56.

International Paper Co. sales dropped 3%, to \$940.4 million, while profits slid to \$78.4 million, off 9.5%.

Crown Zellerbach sales hit \$460 million, only slightly under '56's. Its profits, however, dipped to \$38 million, down 24%.

Thiokol Chemical, growing by acquisition of several rocket firms, chalked up \$1.5 million in profits, a gain of 34%. Its '57 sales were up 42%.

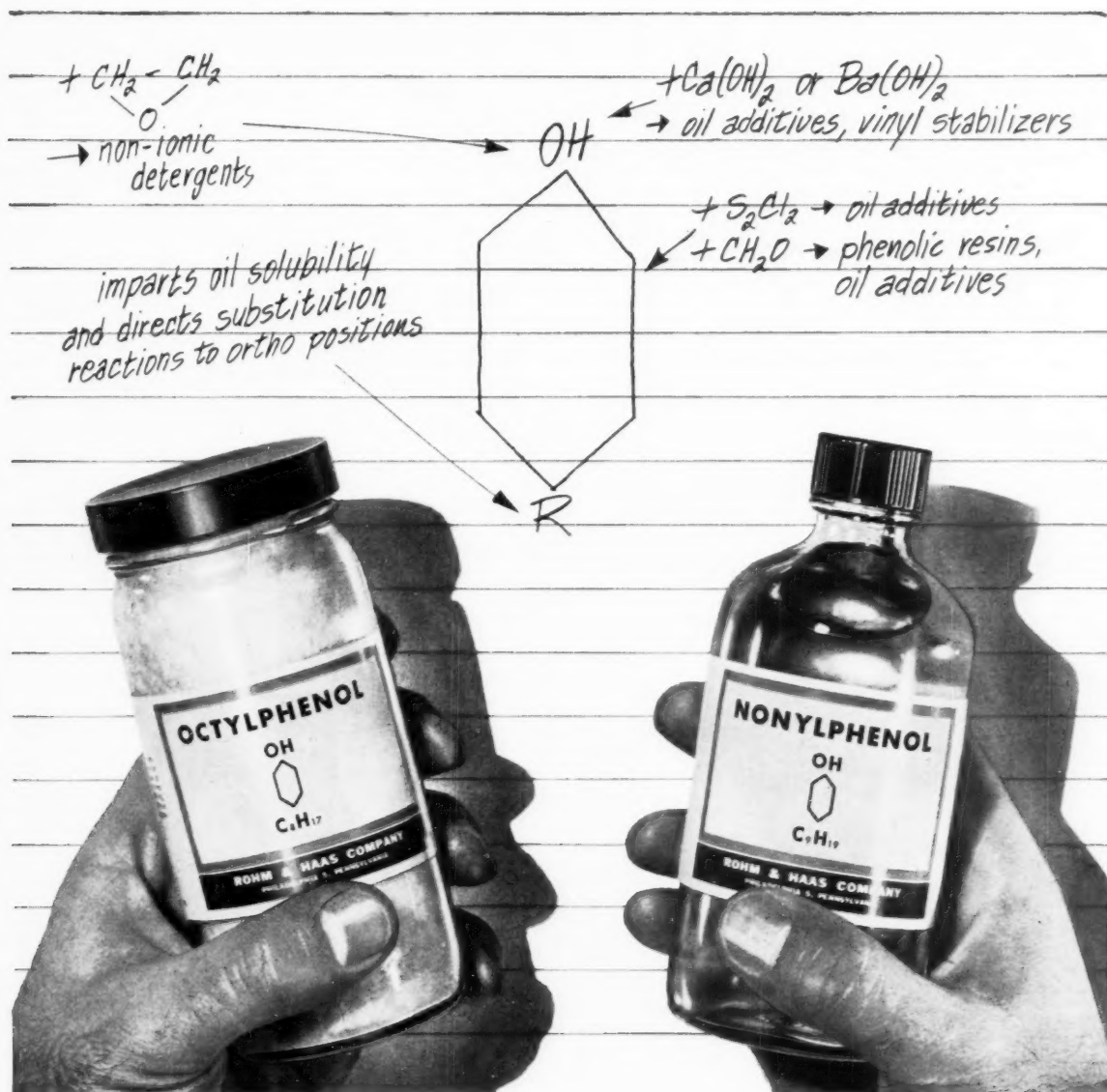
Schering Corp. boosted sales 12%, to \$80.7 million and netted \$15.4 million, an 11% increase.

- Look for a long court conflict over defective polio vaccine.

Cutter Laboratories (Berkeley, Calif.) late last week appealed the state court judgment that ordered the company to pay \$147,300 damages to two polio victims (*CW Business Newsletter*, Jan. 25). Cutter emphasizes that it produced the vaccine in accordance with governmental standards, points out that an Alameda County superior court jury found that the company was not guilty of negligence.

Some of the plaintiffs in the case also are dissatisfied with the judgment. Their lawyer is asking the Alameda court for a new trial, on grounds of "inadequacy of award, insufficient evidence, misconduct of jury, and irregularity of procedure."

- Conventional rocket fuels hoisted Vanguard I into orbit early this week. First stage of the trouble-dogged rocket was propelled by kerosene and liquid oxygen; second stage, by unsymmetrical dimethyl hydrazine and fuming nitric acid; third stage, by a solid propellant—Navy did not reveal which of two alternatives (a rubber-base material, or a special double-base propellant) it used.



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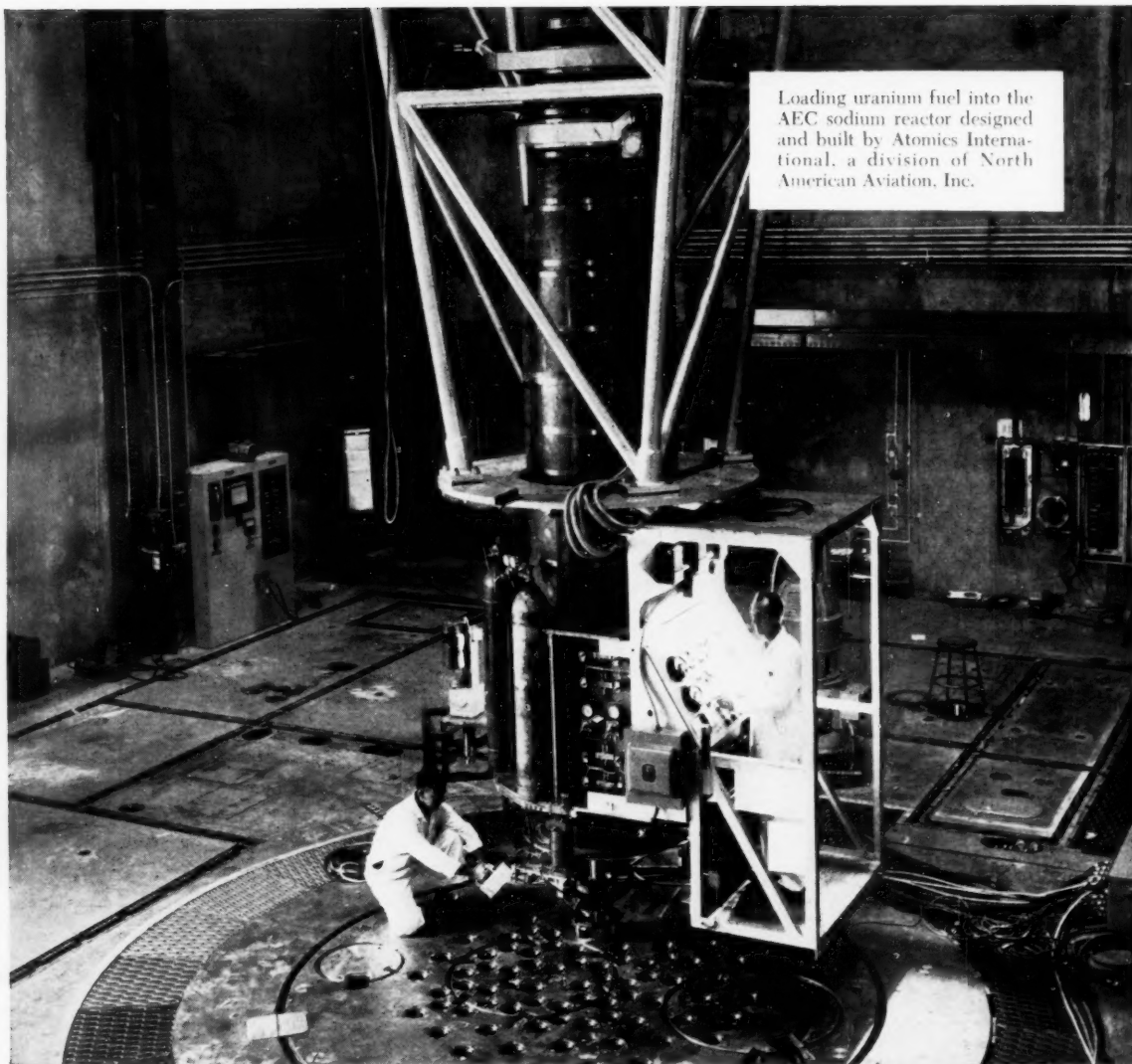


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• Southern California Edison Co. . . . now generating current from this new reactor in the Santa Susana Mountains . . . is the first private utility to produce electricity from a non-military reactor.

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CPI Spending for New Plants and Equipment

(million dollars)

	November estimate	Fourth Quarter '57 Actual spending	Change	First Quarter '58 November estimate	Current estimate	Change	Second Quarter '58*
Primary nonferrous metals	\$ 260	\$ 227	down 12.7%	\$ 182	\$ 177	down 2.7%	\$ 122
Stone, clay and glass products	142	142	—	118	115	down 2.5%	114
Paper and allied products	199	197	down 1.0%	163	170	up 4.3%	156
Petroleum and coal products	1,000	939	down 6.1%	775	744	down 4.0%	784
Rubber products	50	53	up 6.0%	45	43	down 4.4%	47
Chemicals and allied products	523	496	down 5.4%	441	428	down 2.9%	415
CPI total	2,174	2,054	down 5.5%	1,724	1,677	down 2.7%	1,638
All manufacturing	4,351	4,261	down 2.7%	3,425	3,466	up 1.2%	3,319

*Based on business through early March.

Figures compiled by Dept. of Commerce and Securities & Exchange Commission.

Expansion Data Augurs an Upbeat

Chemical process companies are reducing their capital spending only slightly during the first half of this year and are planning increases for the second half. That was pointed up last week by the U. S. Dept. of Commerce and the Securities & Exchange Commission in a report based on a late-February, early-March survey of companies' expansion plans.

Capital spending by chemical process concerns is pegged at about \$7.2 billion for this year, down from nearly \$8.5 billion in 1957.

For all U.S. industry, 1958 outlays for new plants and equipment now are expected to drop by about 13% from last year's record \$36.96 billion.

The CPI's resilience in the face of present economic rigors is seen in the fact that its current rate of spending is only about 3% lower than had been planned as of last October-November, and in the fact that second-half spending this year is expected to rise to about \$3.9 billion—a gain of

18% over first-half investments.

By comparison, the all-manufacturing total is expected to slip from nearly \$6.8 billion in the first half of '58 to about \$6.4 billion during the second half.

That the CPI is holding a steadier capital-spending course this year than are most other industries is borne out by recent statements from the three largest chemical producers.

Du Pont has decided to go ahead with a new Dacron plant and is proceeding with six other major plant projects; Union Carbide has stated that it will stick with the \$150-million expansion program previously planned for 1958; and, early this week, Allied Chemical & Dye indicated its 1958 expenditures for new construction and equipment would be "about the same" as the nearly \$70 million invested last year.

And, although the government's new capital spending report shows that business as a whole is notably

more cautious about allocating money than it was a year ago, it also shows that some industries are planning to increase their expenditures.

Some Spending Up: In fact, a moderate upturn is taking place right now for some segments of the chemical process industries. For the last quarter of 1957, makers of rubber products estimated that their capital expenditures ran about 6% higher than they had anticipated at the start of that period. And during the current first-quarter period, makers of paper and allied products report outlays at more than 4% above the level they had foreseen as of last fall.

What's happening, industry by industry, can be seen by comparing actual spending for the last quarter of 1957 and estimated spending for the first quarter of '58 with the plans reported by company managements last October and November.

For the CPI, fourth-quarter plant investments were off by 5.5%, com-

pared with what was anticipated in October and November. First-quarter spending appears to be down only 2.7% from the earlier expectations. Thus, capital budgets have been tightened, but with deliberation rather than desperation.

Betting on Early Upturn: While the over-all trend in capital spending is toward conservatism, it's significant that some large companies are ruling out cutbacks. The pulp and paper companies' willingness to open their purses a little wider this quarter is a prime example of this reluctance to prune. In view of reported temporary overcapacity in this industry, the boost in plant outlay is interpreted by some economists as an expression of management confidence in the outlook for an early upturn in business as a whole.

Petroleum industry expenditures are another surprise. Big inventories and heavy imports are expected to keep current expansion spending be-

low last year's rate; but the oil companies say they're planning to increase plant expenditures during the final six months of this year.

Most other industries will trim expenditures this year—but not enough to cause any sharp downturn in manufacture of construction materials. Actually, most first-half cuts are being registered by commercial businesses. For all manufacturing, first-quarter spending appears to be 1.2% greater than was anticipated five months ago.

And considering that 1958 industrial growth is continuing so close to last year's all-time high level, even the most pessimistic economists see signs in this report that the year will end on an upbeat.

New Wage Force Looms

A plan to coordinate wage bargaining in the fertilizer industry is on the agenda for International Union of Mine, Mill & Smelter Workers this year. The union, seeking to regain the strength and standing it held some 20 years ago, offered the plan at its Denver meeting last week.

Delegates to the Mine-Mill convention directed the officers to "set up procedures to coordinate bargaining" in fertilizer plants at which the union represents production workers. Most of those plants are in the Deep South. The union claims bargaining rights for 7,500 fertilizer plant workers as well as for "several thousand" employees in related industries such as potash mining and refining.

Giving the delegates a sketch of the copper industry's outlook and employment prospects was Chairman Roy Glover of Anaconda Co.—the first top executive of a major copper concern to speak at a Mine-Mill convention. Glover described the copper industry's long-range outlook as "excellent" despite current low prices and other present problems.

Delegates voted to reaffirm the policy of seeking affiliation with AFL-CIO. This is interpreted as evidence that the union, allegedly Communist-influenced for years, has cleaned house. Mine-Mill had been affiliated with the old AFL until the CIO split off in 1936, and then was in CIO until '50.

As a temporary device to curb unemployment, delegates urged Congress to enact a 30-hour-week law.

Industry Exodus Seen

Direct action aimed at warding off proposed state taxes in New Jersey—which has more chemical plants and employees than any other state—came last week from a major pharmaceutical concern, Johnson & Johnson (New Brunswick).

In a letter to Gov. Robert Meyner, J&J President George Smith warned that the new levies, if enacted, might drive industry out of the state. Meyner advocates the taxes to provide money for the record \$400-million state budget he has submitted to the legislature for the coming fiscal year.

J&J's board of directors, Smith informed the governor, has "established a policy against further major expansion of our facilities in New Jersey. We are not happy to make this decision, but we must cope daily with other manufacturers in states with better business climates."

Various other industries in New Jersey also have opposed the tax plan.

Some months ago, the New Jersey State Tax Policy Commission had recommended a 3% business income tax, for state aid to municipalities. Governor Meyner has suggested that this be boosted to 5% to raise an estimated \$45 million.

Meyner—pointing out that no new tax has been enacted yet—called the J&J directors' action "precipitative." He invited management people to discuss the problem with him.



J&J's Smith warns that new tax might drive industry away.

Annual Spending for New Plants and Equipment (million dollars)

	'56	'57	'58*
Primary nonferrous metals	1,268	1,722	1,266
Stone, clay and glass products	686	572	448
Paper and allied products	801	811	622
Petroleum and coal products	3,135	3,453	3,106
Rubber products	201	200	170
Chemicals and allied products	1,455	1,724	1,621
CPI totals	7,546	8,482	7,233
All manufacturing	14,954	15,959	13,196

* Estimate based on business through early March.

Aluminum on the Stand

Falling demand and production in the U.S., increasing competition abroad and charges of unfair pricing practices are the big aluminum industry problems being explored this week by a Congressional subcommittee in Washington.

The hearings were started last fall to look into die-casting companies' complaints that leading producers of primary aluminum have been selling a few big customers under long-term contracts and at preferential prices. The favored customers, it was alleged, were the major auto makers.

This allegation is still backed by American Die Casting Institute. But since the start of the hearings, the tenor of the investigation has changed. It has been shown that falling sales have put the aluminum companies in a position not so dominant as the die-casters' complaint would imply. Aluminum reduction plants have been cutting back production in all parts of the country, and the committeemen are now asking how the suppliers are helping small users develop new markets for the metal.

In addition, the subcommittee—a branch of the House Small-Business Committee—has heard about the emergence of the Soviet Union as a big-volume, low-price competitor abroad, chiefly in the United Kingdom. President Nathanael Davis, of Aluminium Ltd. (Montreal), says his



Aluminium's Davis tells of Russian 'dumping' of aluminum in U.K.

company has been offering "loyalty discounts" in an attempt to hold its British customers, and also has asked the U.K. government to levy an anti-dumping duty on U.S.S.R. aluminum shipments.

Trying to keep the hearing on its original subject, David Laine, executive secretary of the die-casters' trade group, said his members fear that contracts between aluminum producers and auto makers would wipe out independent die-casters as suppliers to the auto industry. Davis endorsed that view.

General Counsel C. Jay Parkinson, of Anaconda Co., predicted that demand for aluminum will have caught up with supply by about '60. Other firms scheduled to testify: Olin Mathieson, Harvey Machine, Aluminum Smelters Research Institute, and Aluminum Extruders Council.

Ripe for New Issues

Encouraged by an apparently stabilized stock market, a number of chemical companies this month are going ahead with new and secondary security offerings.

Latest is Reichhold Chemicals, which envisioned a new 200,000-share public offering as early as last October but postponed it until market conditions were "favorable" (*CW*, Nov. 30, '57, p. 75). It now feels the time is ripe, hopes to sell 200,000 shares this week priced at about \$26 each.

Of the anticipated \$5 million in proceeds, \$3.5 million will be channeled into new construction, with the rest to be added to working capital.

Mississippi River Fuel Co.'s \$30-million convertible debenture offering—now fully subscribed—will be used to pay off \$30 million in bank loans for construction of a \$16-million ammonia and nitric acid plant near St. Louis, acquisition of Mobar Corp. and Milwhite Mud Sales Co., development of gas and oil properties, and additions to working capital.

Still another new issue that met little buyer-resistance is Olin Mathieson's \$40 million in 5½% convertible debentures (*CW Business Newsletter*, March 15).

More on Tap: Other proposed offerings include 253,000 shares of Stepan Chemical Co. and 225,000 shares of Merck & Co. Inc.

Drug Groups Merge

The long-awaited merger of the pharmaceutical industry's two major trade associations took place last week when the executive committees of American Pharmaceutical Manufacturers Assn. and American Drug Manufacturers Assn. approved unification plans.

In the works for almost two years, the new organization—called the Pharmaceutical Manufacturers Assn.—won't start operating officially until formally ratified at regular annual meetings of the parent groups, April 14-16 for APMA, May 26-29 for ADMA.

Slated to take over as first president of the new group is George Smith, president of Johnson & Johnson (New Brunswick, N. J.). The new PMA will keep its former offices in New York and Washington.



Berlin's Benefactor

Already an international industrialist, now an international philanthropist—that's Henry Reichhold, president and chief executive officer of Reichhold Chemicals, Inc. (White Plains, N. Y.).

Through subsidiaries and licensing agreements, Reichhold's company does business in 13 nations besides the U. S. And now, expanding his role as patron of arts, Reichhold is planning a \$1-million gift to West Berlin, where he spent his boyhood. The donation, for a new academy of arts, was accepted last week by the West Berlin Senate. He reportedly has already given a total of \$2 million to the Detroit Symphony Orchestra.

COMPANIES

Niagara Chemical Division (Middleport, N.Y.), Food Machinery and Chemical Corp., has changed the name of its Canadian affiliate at Burlington, Ont., to Niagara Brand Chemicals. Old name: Niagara Spray Co., Ltd. Regional districts of the Canadian firm have been given greater autonomy.

Sun Chemical Corp. (New York) has consolidated all textile color operations within the new textile color department of its subsidiary, Ansbacher-Siegle Corp. Sun acquired Ansbacher in Dec. '57. Sun's Warwick Chemicals Division will continue to make textile finishes.

Foster D. Snell, Inc. (New York) has acquired another consulting firm: Davis & Bennett, Inc. (Worcester, Mass.). It's the fourth Snell acquisition in the past two years.

American Petrofina, Inc. (N.Y.), an affiliate of a Belgian company, Petrofina S. A., has contracted to buy Petro-Atlas Corp. (Tulsa) and its subsidiary, El Dorado Refining Co. (El Dorado, Kan.) from Atlas Corp. Assets include 10-million-bbl. oil reserves, 125-billion-cu.ft. gas reserves, a 20,000-bbl./day refinery, and 500 service stations.

Kennecott Copper Corp. will trim production 12.5% at its four Western divisions. Work week is to be cut from six days to five. This will bring operations down to about 20% of capacity.

Owens-Corning Fiberglas Corp. (Toledo) has set up Fiberglas Reinforced Plastics Division (FRP) to consolidate all research, production and marketing of reinforced-glass fiber. Headquarters will be in New York.

EXPANSION

Coal Products: Newly formed Columbia Western Corp. will build a \$1.7-million coal carbonization plant at an undetermined plant site in Wyoming. The unit will use a new low-temperature coking process, have a 1,000-tons/day coal throughput.

Hydrofluoric Acid: Pennsalt Chemicals Corp. (Philadelphia) is expanding by an estimated 50% the hydrofluoric acid capacity at its Calvert City, Ky., plant. Construction will be completed in July.

Chemicals: Dixon Chemical & Research, Inc. (Newark, N.J.), will add a 20,000-tons/year aluminum sulfate plant at Newark to its expansion program (*CW*, March 15, p. 32). It's due onstream early next year, with capacity "expandable" to 40,000 tons/year.

Dixon's new affiliate, Dixon Chemical Industries, will build a 300,000-tons/year sulfuric acid decomposition plant and a 10,000-tons/year hydrofluoric acid plant at Paulsboro, N. J.

Glass: Libbey-Owens-Ford Glass Co. (Toledo, O.) plans to boost '58 capital expenditures 50%, to \$15 million. The company will double technical facilities and continue expanding glass furnaces. The expansion is planned in spite of an 8.5% drop in sales last year, to \$237.1 million. Earnings dropped 4%, to \$28 million.

Ammonia: Coastal Chemical Corp. has started building a 150-tons/day ammonia plant at Pascagoula, Miss., due onstream in December. Chemical Construction Corp. is the designer and builder. This unit will be at the site where Coastal—a subsidiary of First Mississippi Corp.—makes sulfuric and phosphoric acids (*CW*, Jan. 4, p. 19). Coastal will use all three chemicals to make ammonium phosphate fertilizer.

FOREIGN

Synthetic Rubber/Japan: Recently formed Japanese Synthetic Rubber Co., Ltd., will build a new plant near Yokkaichi. Due in production in 1960, it will turn out 45,000 metric tons/year of general-purpose synthetic rubber. For the plant, Houdry Process Corp. (Philadelphia) has just licensed the Japanese firm to build a dehydrogenation process unit with 25,000-short-tons/day butadiene capacity. It will handle the engineering for this unit.

Pharmaceuticals/Japan: Schering AG. (Berlin) is stepping deeper into the Japanese chemical scene with formation of a new subsidiary, Nippon Schering Ltd., for pharmaceutical manufacture. Schering has also acquired 50% interest in its former Japanese representative, Nishidoko Yakuhin K. K.

Naval Stores/Mexico: Hercules Powder Co.'s first wood chemicals plant in Mexico, a 25-million-lbs./year naval stores unit near Ciudad Hidalgo, Michoacan, starts up this week. The plant will be operated by Corbu Industrial, S.A., a Mexican firm in which Hercules holds the major interest. Products: rosin, turpentine, pine oil, other terpene chemicals.

Polystyrene/Australia: CSR Chemical Pty. Ltd. is building a high-impact polystyrene plant in Rhodes, N.S.W. Production is slated to start in May. Dow Chemical Co. supplied the license and technical help.

Nylon/Hungary: Hungary is finishing a caprolactam plant at the Hungaria Chemical Works. The plant will cost some 15 million forints (about \$1.2 million), will have a nylon capacity of 150 tons/year. Test runs start this month; full production is slated to start midyear.

Washington

Newsletter

CHEMICAL WEEK

March 22, 1958

A sweeping overhaul of U.S. foreign trade procedures was urged by the leading chemical industry associations at House Ways & Means Committee hearings on the Reciprocal Trade Agreements Act extension bill last week.

A new Tariff Commission, with complete power over all trade matters, subject only to Congressional veto, was endorsed by SOCMA President R. Wolcott Hooker. This proposal, embodied in a bill by Rep. W. J. Bryan Dorn (D., S.C.), is also backed by hardwood-plywood producers and some metal-mineral mining interests. Despite Dorn's claim that it would increase, rather than decrease, U.S. foreign trade, it is too extreme to be given any chance of passage this session. Short of that, Hooker asked stronger defense-essentiality relief and transfer of tariff-reducing authority from the President to Congress.

Manufacturing Chemists' Assn.'s more moderate stand was explained by Richard F. Hansen, chairman of the group's trade committee. He hit hard on the point that chemical imports already have had duty rate cuts of almost 50% more than the average of imported items. He asked that Congress review the President's tariff decisions, that duty cuts be made on a product-by-product basis, and that the defense-essentiality provisions be strengthened.

New tariff definitions are in the works at Tariff Commission. They would redefine the general commodity and product classifications on present tariff schedules, some of which go back to 1789. Both MCA and SOCMA have appeared at commission hearings to back the changes, with a few technical language modifications. The new definitions wouldn't mean significant changes in tariff rates.

Commission staffers have scheduled a June 24 hearing date for the "escape clause" relief petition filed by Barium Reduction Corp., which asks a maximum 50% duty boost on imported barium chloride.

The government's Louisville butadiene plant will stay inactive. Publicker Industries' three-year lease of the butadiene-from-alcohol facilities runs out early next month, freeing the government to offer the plant for sale. But the General Services Administration (which takes over the plant from Federal Facilities Corp. April 29) has asked Publicker to stay on to maintain it. A contract is likely to be signed any day. (For news on another government-leased plant, see p. 62).

The FCC exposé has blocked passage of a chemical additives bill. The House Commerce Subcommittee has been forced to drop most of its legislative plans after the finger-pointing contest over a Miami TV station license put its inquiry of federal regulatory agencies firmly into this fall's election politics.

Washington

Newsletter

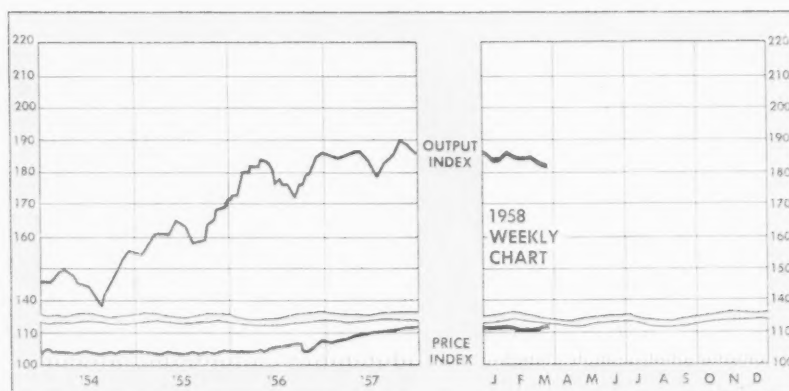
(Continued)

There is still talk of a one-day hearing to take testimony from Food and Drug Administration officials on chemical additives bills. But the date is uncertain, following two postponements of scheduled FDA testimony last month. The committee also is promising a brief hearing on precautionary labeling bills—proposals to tighten controls on hazardous chemicals used in household products. But it won't name the date.

Helium expansion plans will be revived. Interior Secy. Fred Seaton will ask Congress for \$15-20 million to build a new, 240-million cu.ft./year helium extraction plant in Texas. Plans are to have the facility in operation by '60—in time to meet an expected sharp rise in requirements for missiles and other advanced military programs.

The Administration originally planned to include the plant in its fiscal-'59 budget request that went to Congress last January—but the Budget Bureau rejected the request in line with the White House economy freeze on new construction. Now, the plan is being dusted off for inclusion in a supplementary appropriation request. The plant would boost U.S. helium capacity to 600 million cu. ft.

Private industry is showing enthusiasm over government efforts to lure private capital into the helium-producing business. But officials are optimistic that industry will put up the money if guaranteed a firm government market for helium at a profitable price.



Business Indicators

WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	182.0	182.0	186.0
Chemical Week wholesale price index (1947=100)	110.9	111.0	108.7
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	40.48	39.21	41.61

MONTHLY

Trade (million dollars)

	Manufacturers' Sales			Manufacturers' Inventories		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All manufacturing	26,266	26,690	29,956	52,948	53,520	52,434
Chemicals and allied products	1,866	1,890	1,996	3,817	3,820	3,593
Petroleum and coal products	2,763	2,654	3,241	3,618	3,644	3,133

U.S.I. CHEMICAL NEWS

March 22

★

A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★

1958

Polyethylene-Brass Bonds Possible with New Adhesive

A new adhesive developed by Bell Telephone Laboratories and reportedly able to resist a pull of 1,000 psi is being used to bond polyethylene directly to brass, brass-plated metals, and rubber. It is based on a compound described as partly hydrogenated polybutadiene, which is vulcanized by the addition of other materials. Any degree of unsaturation of the polybutadiene from 3-30% is reported to provide excellent adhesive action.

Temperatures from 250-350 F and pressures of 100 psi or less are required for bonding. A layer of the adhesive 2 or 3 mils thick is desirable. This layer can be brushed or sprayed on, or inserted between the materials to be bonded as a thin, prefabricated sheet.

Possible uses include bonding of polyethylene to brass in submarine cable amplifiers for underwater phone cables, linings for tanks and plating racks.



Sandwich of brass, polyethylene and rubber shown here is held together by new adhesive. It can support about 2,000 pounds.

ISOSEBACIC® Acid Synthesis To Be Described At April ACS Meeting

A paper on U.S.I.'s new dibasic acid synthesis is to be presented at the symposium on alkali metals, being held at the 133rd national ACS meeting in San Francisco, April 13-18.

The process described in the paper was developed for use in the company's new ISOSEBACIC® acid plant which is soon to go on stream. In this synthesis, butadiene is reacted with very finely dispersed sodium to form disodiooctadiene — an organometallic compound. Carbonation, hydrogenation and acidification then yield three major products — sebacic acid, 2-ethylsebacic acid and 2,5-diethyladipic acid. The mixture of the three has been trade named ISOSEBACIC acid by U.S.I. and is finding application as a vinyl plasticizer and as an intermediate for many plastic applications. Until the development of this synthesis, 2-ethylsebacic and 2,5-diethyl-

MORE

National Petro-Chemicals Corp. Becomes a Wholly-Owned Subsidiary of National Distillers

Giant Tuscola, Illinois Plant Continues Under U.S.I. Management

Panhandle Eastern Pipe Line Company's 40% minority interest in National Petro-Chemicals Corporation has been transferred to National Distillers, which thus becomes sole owner. Panhandle has acquired 1,500,000 shares of National

Distillers common stock in exchange.

National Petro owns and operates a large integrated petro-chemicals plant at Tuscola, Illinois. U.S.I. Division of National Distillers will be responsible for management of this chemical complex as it has been in the past.

Expansion of National Petro beyond the original plan was one factor that led to the transaction. As originally conceived, Petro's basic raw materials were hydrocarbons extracted from Panhandle's natural gas pipeline at Tuscola. However, the company's new polyethylene plant at Houston will use ethylene purchased from another source.

Nixon Named Petro Vice President

John W. Nixon has been elected Vice President of National Petro, and manager of all National Distillers operations at Tuscola, including the Petro and U.S.I. facilities. Dr. Robert E. Hulse, National Distillers Executive Vice President, was named National Petro Executive Vice President, and Robert Cornwell, U.S.I. Vice President in Charge of Production, has also been named a Petro Vice President.

Since 1951, Petro has been producing ethylene, ethyl alcohol, ethyl chloride, ethyl ether, LPG and later polyethylene at Tuscola. It supplies hydrogen to U.S.I.'s ammonia production facilities. Petro also has the facilities to manufacture other related bulk chemicals on long term contract basis if the demand arises.

New Technique for Bonding Non-Ferrous Metals Employs Alkali Metal Chloride Mix

Non-ferrous metals which are difficult to join by welding, brazing or soldering can now be bonded by a new and inexpensive process. A solder-like wire, consisting of a mixture of zinc, lithium, potassium and sodium chlorides wrapped in a zinc sheath, is applied to the metal surfaces to be joined after they have been heated to 800° F, the melting point of the wire.

The bond formed is chemical — a eutectic mix of zinc, the alkali metals, and the metals being joined. It is claimed to be strong, corrosion-resistant, and with electrical, physical and chemical properties similar to the metals concerned. Similar or dissimilar surfaces can be bonded using the new technique.

Among the materials which, it is claimed, can be joined by this technique are titanium, zirconium, aluminum, copper, magnesium, zinc, brass, silver, gold, beryllium, platinum, osmium, thorium, uranium, vanadium, tungsten, and some types of steel.



Panoramic view of a portion of the National Petro-Chemicals Corporation plant. Ethyl chloride, ethyl ether and ethyl alcohol production and storage facilities are visible in the background.

March 22 ★

U.S.I. CHEMICAL NEWS

★ 1958

CONTINUED

ISOSEBACIC

adipic acids were relatively unknown.

Reaction conditions are very closely controlled to dimerize butadiene. If polymerization of butadiene were to occur, yields would be drastically reduced.

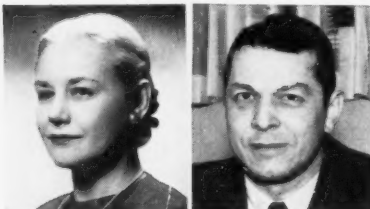
The paper describes prior art on the synthesis and general laboratory procedure, discusses the reaction and isomer distribution, and mentions other applications of the synthesis. It will be presented by Dr. Charles E. Frank, Manager of U.S.I. Organic Research.

Other Alkali Metals Symposium Topics

Some of the other topics planned for the alkali metals symposium are: New developments in liquid metals handling equipment; alkali metals as polymerization catalysts; sodium as a nuclear reactor coolant; manufacture of titanium by sodium reduction; alkali metals derivatives as components of Ziegler-type polymerization catalysts; manufacture of synthetic natural rubber, and large scale manufacture of sodium borohydride.

Paper on Titanium Patent Literature

A paper entitled "Survey of Patent Literature on Preparation of Titanium Metal" will be given for the Division of Chemical Literature at the San Francisco ACS meeting. This report, to be presented by Dr. Janet Berry who manages U.S.I.'s patent section, will graphically illustrate the great growth in titanium technology from patents obtained during the past 35 years.



Dr. Janet Berry and Dr. Charles Frank will present papers at the April ACS meeting in San Francisco.

Zirconium Provides Bright Light in Tiny Flashbulb

A new photoflash bulb is now on the market which is one-fourth the size of conventional bulbs, yet provides the same amount of light. In addition, the new photoflash gives faster light, and is therefore claimed to be the first bulb which can satisfy both box camera users and professionals who require speed.

These results have been accomplished by replacing shredded aluminum with shredded zirconium. The latter metal oxidizes more efficiently, giving 50% more light per unit weight of oxygen consumed. It creates lower pressure at flash peak, permitting higher initial pressure for faster light. It burns cleaner, blackens the bulb less, and so gives more light.

The new bulb costs no more than regular photoflashes, even though zirconium is currently more expensive than aluminum. Increased production by zirconium suppliers like Mallory-Sharon Metals (owned 1/3 by U.S.I.) is expected to make zirconium available in larger quantities for this and other uses.

Methionine Overcomes Urinary Infections

Large doses of methionine have cleared up stubborn urinary tract infections which are resistant to antibiotics or other therapy, according to experiments at an eastern medical school.

Upon oral ingestion, methionine acted as an urinary acidifier, and reduced both the pH and the bacterial count of the urine. After methionine intake, the urine contained an antibacterial substance not present before methionine was given.

Have you a new product to tell the world about?

Make it routine to send your publicity releases to U.S.I. Chemical News, often called the "Front Page of the Chemical Process Industries." Write the Editor at the address below.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Polyethylene containers can now be coated with a varnish said to cut static, give high sheen, prevent scuffing. Another coating now available is claimed to reduce oil permeability and oxygen diffusion, give glass-like clarity. **No. 1331**

Ceramic woven fabrics for high-temperature insulation have been introduced which will withstand heat up to 2,000°F., according to producer. Made of aluminum silicate fiber, they are lightweight, flexible, have low bulk factor. **No. 1332**

New silicone compound containing silicic groups in its structure can now be obtained. It is said to provide sunscreening action, does not wash off easily in water. **No. 1333**

Porous teflon filter cups 12 inches high by 5 inches I.D. can now be obtained for atomic energy use. These cylindrical cups are molded in one operation, are porous in the lower 7 inches only. They remove particles over 3 microns. **No. 1334**

Acylase I, an enzyme obtained from hog kidneys and capable of separating many synthetic di-amino acids, is now available in developmental quantities. Enzymatic resolution is said to be more economical than other techniques. **No. 1335**

New type of stirring paddle combines centrifugal force, suction, shearing action, counter whirl. Claimed to promote high flow velocity through entire vessel, ensuring maximum dispersion with minimum particle size. **No. 1336**

Acrylic emulsion paint behavior under test exposure in every climatic region in the U.S. is reported in a 56-page brochure just published. Detailed summaries, tables and photos on 3,000 tests which began in 1952-53 are included. **No. 1337**

New infrared analyzer has been announced for measuring concentrations of gases of medical interest such as carbon dioxide, nitrous oxide, cyclopropane, etc. It is expected to be used in such work as pulmonary investigations and research on new anesthetics. **No. 1338**

A method for restoring the flavor of processed foods by adding flavor enzymes is described in a reprint now available. The studies described were carried out on cabbage and related foods, but the method works with many other foods. **No. 1339**

PRODUCTS OF U.S.I.

ALCOHOLS

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OTHER PRODUCTS

PETROTHENE® Polyethylene Resins

Organic Solvents and Intermediates: Normal Butyl Alcohol, Amyl Alcohol, Fusel Oil, Ethyl Acetate, Normal Butyl Acetate, Diethyl Carbonate, DIATOL®, Diethyl Oxalate, Ethyl Ether, Acetone, Acetoacetanilide, Acetoacetyl-Ortho-Chloranilide, Acetoacetyl-Ortho-Toluidide, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate, ISOSEBACIC® Acid, Sebacic Acid, Urethan U.S.P. (Ethyl Carbamate), Riboflavin U.S.P.

Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Urethan USP, Riboflavin USP, Intermediates.

Heavy Chemicals: Anhydrous Ammonia, Ammonium Nitrate, Nitric Acid, Nitrogen Fertilizer Solutions, Phosphoric Fertilizer Solution, Sulfuric Acid, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide, Sodium Sulfite, Sodium Sulfate.

Reactive Metals, Oxides and Salts: Zirconium, Zirconium Oxide, Zirconium Tetrachloride, Titanium, Hafnium, Hafnium Oxide, Hafnium Tetrachloride.

Development Chemicals: Ethylaluminum Sesquichloride, Methylaluminum Sesquichloride, Monomethyl Hydrazine, Triethyl Aluminum, Trimethyl Aluminum, Unsymmetrical Dimethyl Hydrazine.

Animal Feed Products: Antibiotic Feed Supplements, BHT Products (Antioxidant), Calcium Pantothenate, Choline Chloride, CURBAY B-G®, Special Liquid CURBAY, VACATONE®, Menadione (Vitamin K₃), DL-Methionine, MOREA® Premix, Niacin USP, Riboflavin Products, Special Mixes, U.S.I. Pernadry, Vitamin B₁₂ Feed Supplements, Vitamin D₃, Vitamin E Products, Vitamin E and BHT Products.

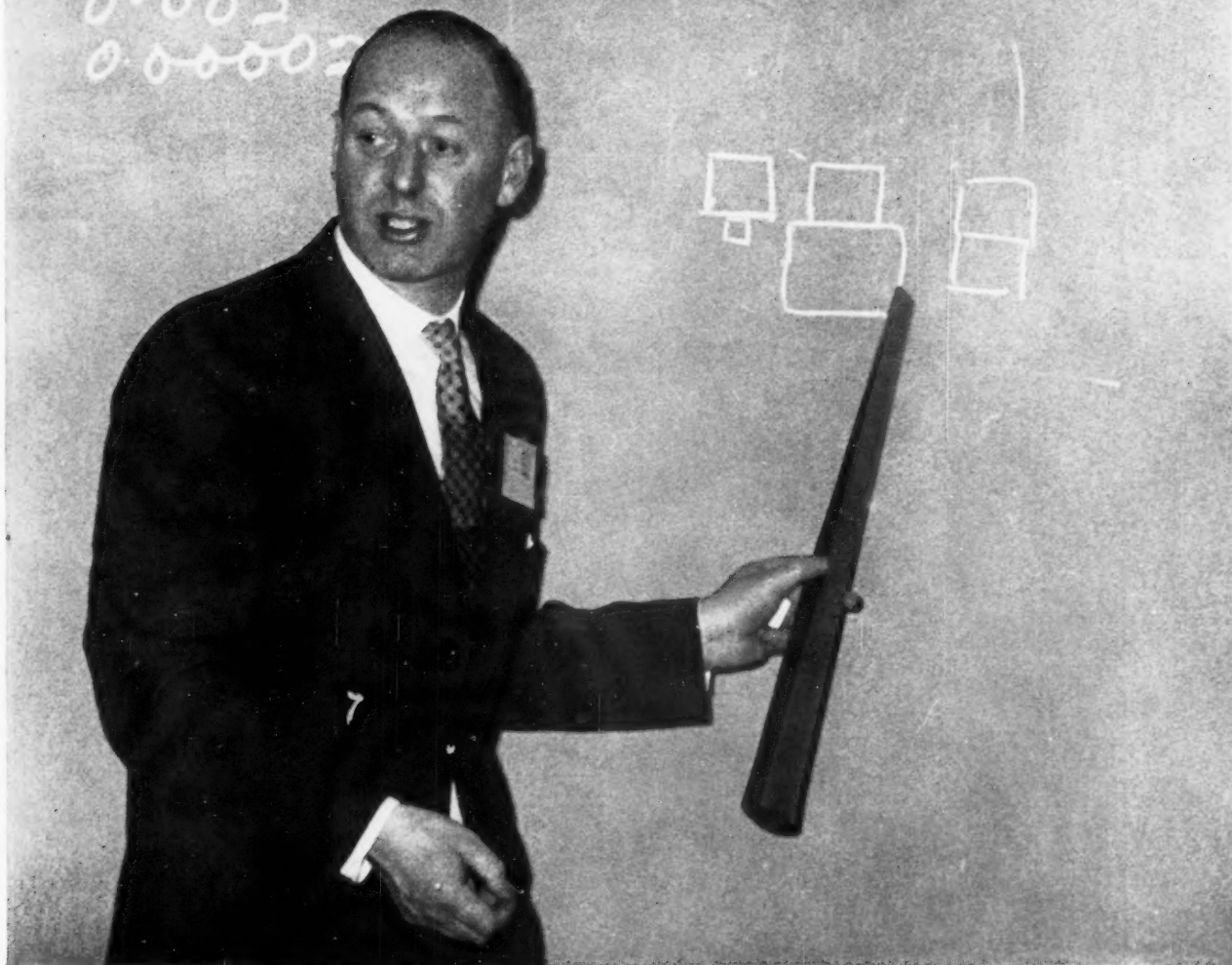
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RESEARCH



Metachemical's Denis Hughes wields micrograin nickel de-icer shield in metallurgical lecture.

CW PHOTO — SYD KASSON

Pointing Out Pluses of Fine-Grain Plating

This week, H. Denis Hughes, chairman of Metachemical Processes Ltd. (Crawley, England), is giving prospective licensees a chalk-talk on its new micrograin electrolytic plating technique. Aside from its potentials in the development of corrosion-resistant chemical process equipment, the technique offers some revealing insight into plating research.

The process, now commercialized with nickel, is said to provide plating that has an unprecedented combination of hardness, flexibility, and abrasion- and impact-resistance. Micrograin nickel is already being used on the propeller de-icing units of Vickers Viscount aircraft to protect them

against hail and stones. And it may eventually prove valuable in such widely differing applications as the manufacture of flexible tubing and the sheathing of missiles.

Details of the new process were revealed last week by Hughes, who, along with technical director R. W. Lewis, developed it. Hughes is now looking for a site in the U.S. where he can set up facilities to plate by the new method, which is already being employed in Toronto, Can., by Dalic Metachemical Ltd.

Secret of the nickel's unusual properties is its fine grain—so fine (about 0.00002 in. vs. 0.003 in. in diameter for conventional nickel plate) that it

defies etching for micrographic inspection.

Fine grain is achieved by depositing the nickel from a standard nickel sulfate bath, containing no organic additives, onto a mandrel coated with about 15% (by weight) resinous binder (e.g., plasticized vinyl) and 85% conductive material (e.g., graphite, powdered metal) having an extremely small particle size.

The size of the nickel grains is determined by the size of the conductive particles on which they grow. Metachemical is researching particles of even smaller size, hopes to increase hardness even beyond the present Brinell 600. Regular nickel



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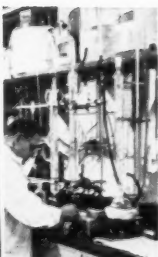
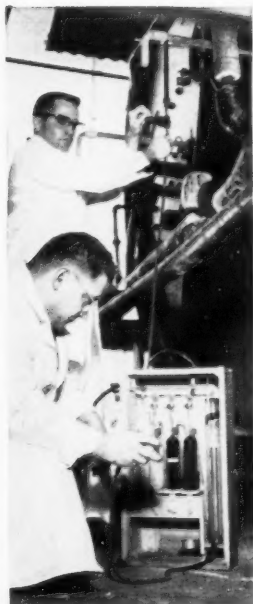
*TITANOX is a registered trademark for the full line of titanium pigments offered by Titanium Pigment Corporation.



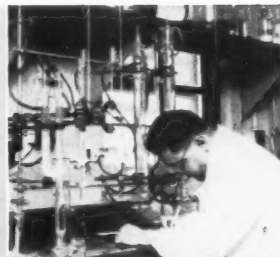
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RESEARCH

plate is in the 90-140 Brinell hardness range.

Hughes has high hopes the new method of electroforming can be used with other metals, too. In tests, extra-hard copper and lead have been prepared. Next, he hopes to explore the properties of indium and gallium in micrograin form.

EXPANSION

- Stoner Mudge Co.'s (Pittsburgh) new research and development center will increase the firm's emphasis on coatings for the container, paper, appliance, automotive, textile and metals industries.

- Pitman-Moore Co. (Indianapolis) plans a \$1.5-million research center in northwest Indianapolis, will move all pharmaceutical, chemical research there. Feature: the new building will be windowless.

- Food and Drug Research Laboratories Inc. (New York), formerly Food Research Laboratories Inc., has moved to new quarters in Maspeth, N.Y.

PRODUCTS

Selenium Selector: Trace selenium may now be determined with J. T. Baker Chemical Co.'s new reagent, 3,3'-diaminobenzidine hydrochloride. It's suggested for use in the analysis of electronic materials, copper and ferrous alloys, and high-purity copper.

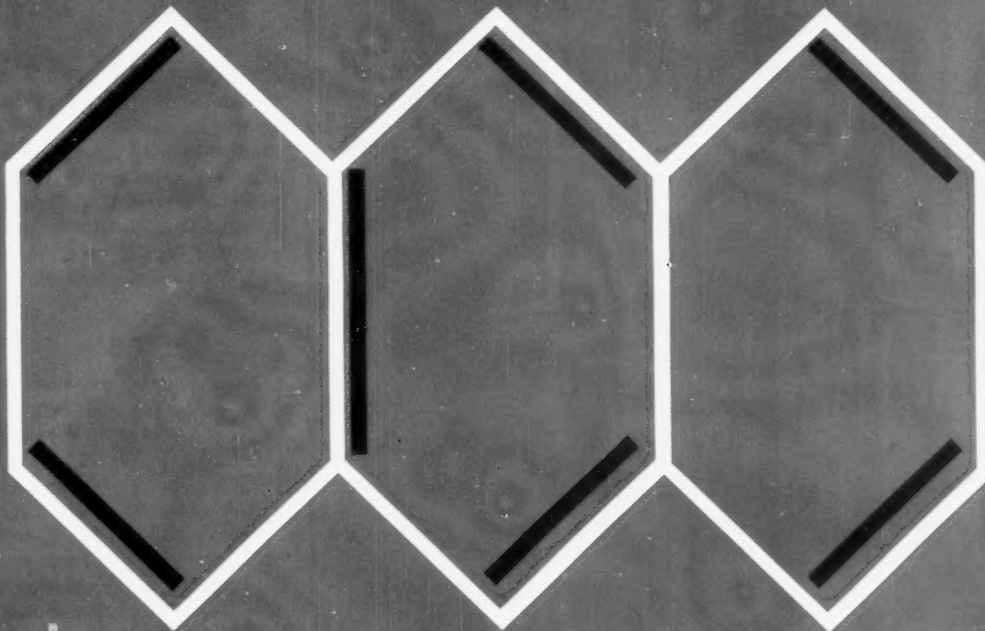
Dye Debut: Two new yellow dyes are available from Canadian Industries Ltd. (Montreal). Offered for paper printing uses: Chlorazol Paper Yellow FG 300, for alkali-fast dyeing; Quinoline Yellow KTS, for acid dyeing.

Fluoro-organics: Pennsalt Chemicals Corp. (Philadelphia) has two new fluoro-organic entries — trifluoroethyl chloride and trifluoroethanol. Suggested uses: as an intermediate in synthesis of shock-therapy compounds, fire-retardant polymers, anesthetics and dyestuffs.

Strain Easer: A new muscle relaxant, 5-chlorobenzoxazolinone, is now being marketed by McNeil Laboratories, Inc. (Philadelphia). Named Paraflex, it's for sprains, etc.

Steroid Entry: A new derivative of prednisolone, Squibb's Kenacort (9- α -

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actions. It can be reduced, nitrated, sulfonated and reacted with halogens. In addition, anthracene exhibits photosensitive properties . . . absorbs ultraviolet light . . . and emits scintillations when exposed to certain types of radiation.

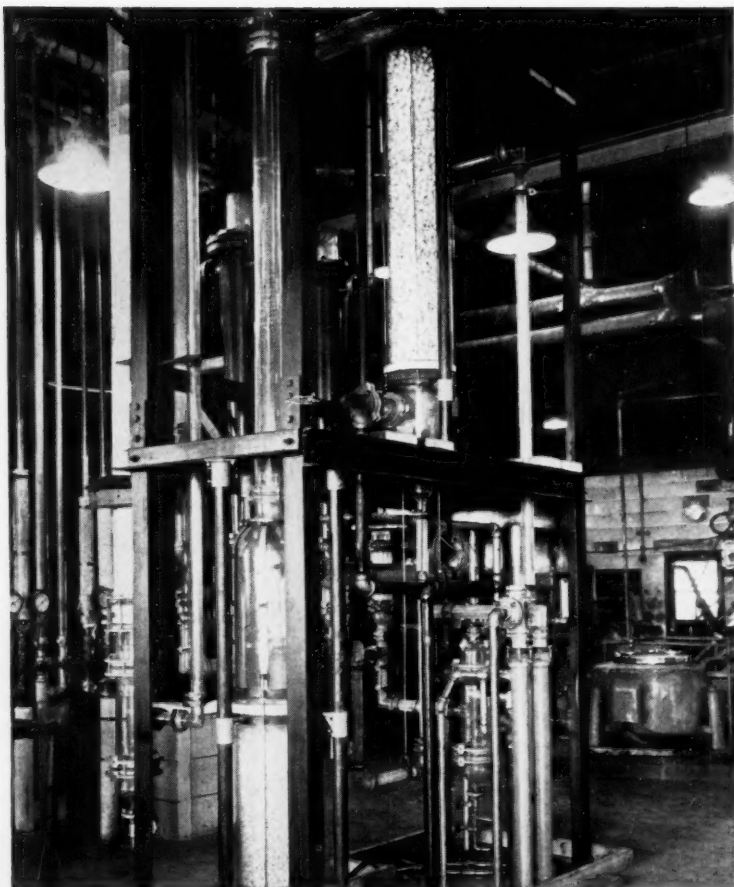
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How Kay-Fries uses PYREX® Pipe to make fine organics finer

The difference between top-grade and just so-so fine organics is often a trace of impurity that sneaks in through absorption and scrubbing towers, or through cooling tubes and piping, or through heat exchangers.

Kay-Fries Chemical Company keeps such traces out of its distilled organics by using PYREX Pipe in *all* this equipment.

Of all the acids only hydrofluoric can corrode this glass and release impurities. Of all the alkalis, only those above pH12 have to be watched. *Maintenance practically nil.* The smooth inert surfaces of PYREX Pipe make scale and

sludge build-up highly unlikely.

Inspections are quick and sure since the equipment is transparent. Should any blocking occur, you can locate it and determine its nature exactly, then remove only the section that's affected . . . and removal is quick and easy.

A completely new bulletin on PYREX Pipe and other processing equipment tells more explicitly how this glass helps solve corrosion problems. It also reveals the ease of installation and maintenance that has made PYREX equipment a common sight in the processing industries.

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CORNING GLASS WORKS

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RESEARCH

fluoro-16- α -hydroxy prednisolone), has been found useful in corticosteroid therapy. It reportedly causes no psychic stimulation nor sodium-and-water retention.

Intermediates: Five intermediates newly available from Catalin Corp. of America (New York) include: dinitrile azoisobutyric, a polyvinyl chloride blowing agent; α -amino pyridine, a pharmaceutical intermediate; *p*-chlorometacresol, a fungicide and preservative; methylene aniline, a hardening agent; and mucochloric acid, a color-film intermediate.

REPORTS

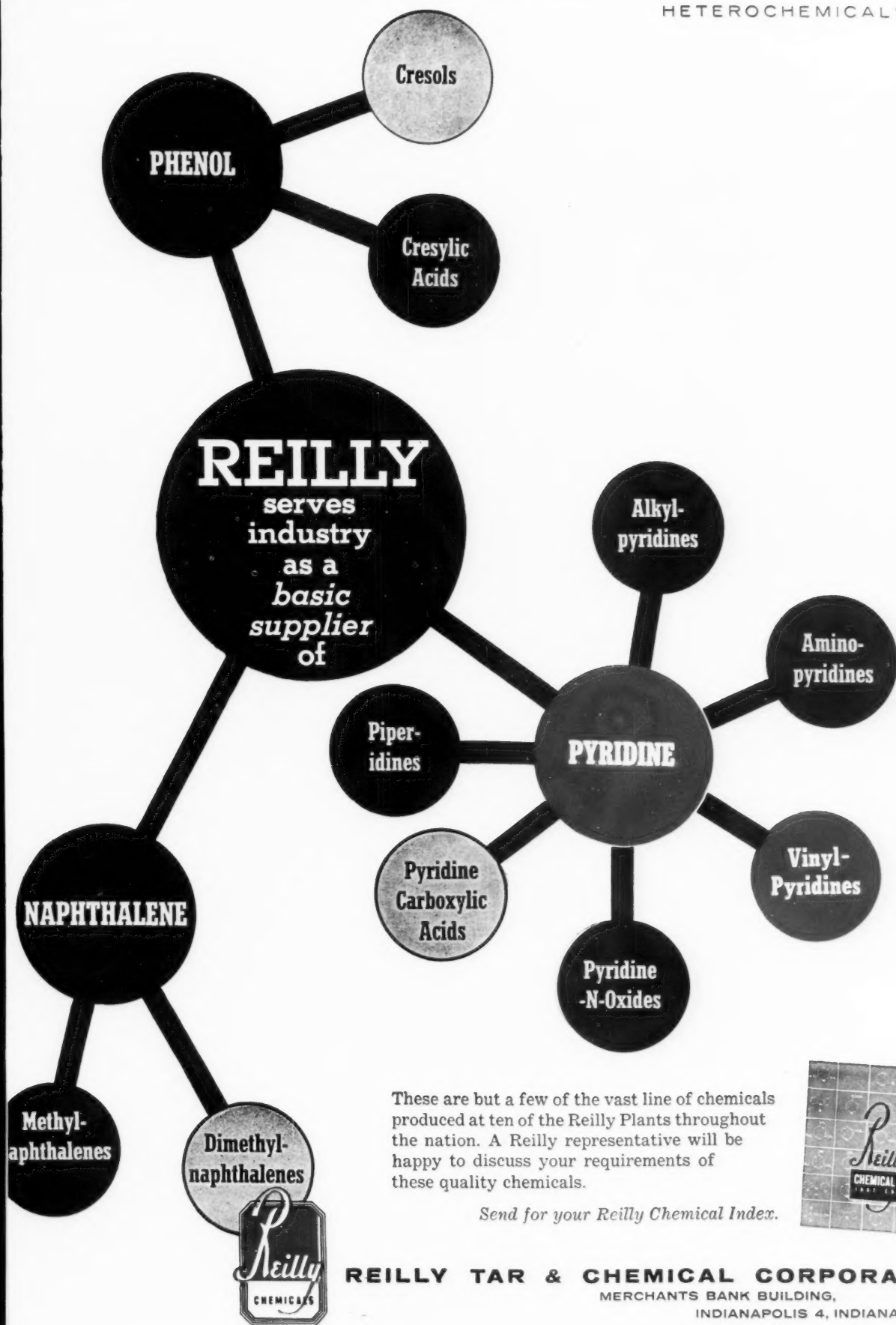
These reports are available from Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.:

- Three air-drying protective coatings systems are evaluated in "High-Temperature Protective Coatings for Magnesium," an Air Force study (PB 131073, \$3). The preferred system, designed for protection of magnesium alloys up to 500 F under high-humidity conditions, is based on an epoxy-polyamide vehicle. The two other methods are based on styrenated acrylonitrile-modified alkyd-silicone copolymer resin and a mixture of an epoxy ester and a silicone resin.

- "Rapid Identification of Nitrogen, Phosphorus, Silicon and Titanium in Coating Vehicles" (PB 131291, 50¢) describes a 10-minute one-step system to obtain general classification, identification of unknown coating systems. Four simultaneous digestions are made, using a special Kjeldahl micro-technique. The system may also have quantitative applications.

- A report on development of the use of radiation in food processing reviews the radiation process and early research and development efforts, also surveys what remains to be done before industry may use the process. It's called "The Interdepartmental Radiation Preservation of Food Program: First Report" (PB 131169, \$1).

- Four "Catalog of Technical Reports" listing research reports available from the Office of Technical Services cover Ultrasonics (CTR-288, 10¢); Synthetic Lubricants (CTR-21, 10¢); Soaps and Detergents (CTR-333, 10¢); Polyethylene (CTR-332, 10¢).



These are but a few of the vast line of chemicals produced at ten of the Reilly Plants throughout the nation. A Reilly representative will be happy to discuss your requirements of these quality chemicals.

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PRODUCTION

Blindfolds Open Foremen's Eyes to



Squibb's 'blind' foreman tries lighting cigarette, brushing teeth.



Dialing the telephone in 'total darkness' proves difficult task.

Foremen are sobered by aspects of 'reading' a sample of Braille.



This week, foremen at Olin Mathieson Chemical Corp.'s E. R. Squibb Division plant at New Brunswick, N.J., are finding out what it is like to be blind. As their counterparts at Squibb's Brooklyn, N.Y., plant had done two weeks ago (pictures), they perform simple, every-day tasks—the lighting of a cigarette, dialing the telephone, brushing their teeth—in the total darkness of blindfolds.

Management is trying this bit of dramatic realism to stimulate interest in eye safety at the two plants. And OM plans to use the technique soon to aid safety campaigns at its other plants throughout the country.

"The experience stays with you," says F. A. Gerard, the firm's safety manager. Gerard is no stranger to the blindfold program. He used it with success at OM's East Alton, Ill., plant when it was first offered several years ago. When it was recently recalled by the National Foremen's Institute (a division of Vision, Inc., New York), and again offered to industry, Gerard did not have to be resold on the program's value to OM's skein of plants.

Developed in Blindness: Called "Let's Pretend," the idea was conceived by E. F. Chittenden, safety director of the Army's General Quartermaster Depot (Columbus, O.), after he was temporarily blinded by an accident. The program NFI offers consists of a meeting guide, a half-hour long-playing record (which tells the blindfolded person just what to do) and individual kits containing blindfold, a cigarette, toothbrush, shoe laces, cloth swatches, a page of Braille, other items. The kits are sold to the companies for \$1.25 each; the guide and record, \$30.

On the recording, Chittenden explains how a day's routine activities must be handled in blindness. And, blindfolded, the listeners participate. Among the more difficult tasks: sifting toothpowder onto a toothbrush, selecting clothing by the feel of the cloth, separating black from brown shoes by the feel of the shoe laces.

Sales Force: Although some firms have all employees undergo the tasks blindfolded, OM gives it only to foremen. American Cyanamid, which

Safety

will introduce the program this month at its Fortier, La., plant, will follow the same pattern, use it just for supervisory personnel, including the foremen.

Both firms consider the attitude of the plant worker's immediate superior as the deciding factor in the success or failure of a safety campaign. Sell the supervisors on enforcing observance of safety regulations and they'll sell the operators, say the firms.

U.S. Industrial Chemical Co.'s safety director, Joseph Prabulos, also likes the realism of the program, says it has plenty of impact—the ingredient missing in many safety programs. USI has sent kits to all of its safety supervisors, leaves it to them to decide whether to use the blindfold technique.

But, as Prabulos points out, the half hour of "blindness" is not a full program in itself. He believes it should be used to make a hard first impression upon which a local eye-safety campaign can be based. The campaign could put across new regulations covering areas in which goggles should be worn, or kick off a flurry of posters re-emphasizing existing rules and safe practices.

Also, Prabulos feels that "Let's Pretend" may be used for individuals as well as for groups to emphasize the hardships of accidental blindness to individuals who have disregarded eye-safety programs.

Others, Too: Other CPI firms that will soon give the program a tryout in at least one plant are Rohm & Haas, Diamond Alkali, Pennsalt Chemical, American Potash & Chemical, Socony Mobil Oil, Standard Oil of Ohio, and Missouri Portland Cement.

Union Carbide's Silicones Division plant at Long Reach, W. Va., which will soon use the program, typifies, in a way, many companies' attitude toward the plan. Carbide will use it to keep up interest in a safety program that has already produced a record of over a million man-hours worked without a lost-time accident.

CW PHOTOS—LIONEL CRAWFORD

Foreman gropes for ringing phone, bumps into desk, misses.



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PRODUCTION

EQUIPMENT

Oxygen Indicator: Mine Safety Appliances Co. (Pittsburgh) is out with a new portable indicator for checking the oxygen content of air and other gases. Its range is 0 to 25% oxygen by volume; accuracy is said to be $\pm 1/2\%$; weight, 5 3/4 lbs. Various types and lengths of sampling lines and probes are available.

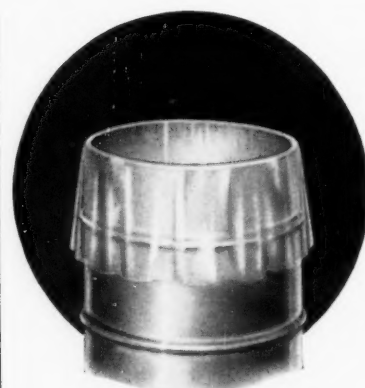
Welding Aid: A pipe-rotating machine for simplifying and speeding the welding of pipe and pipe fittings is a new offering by Cecil C. Peck Co. (Cleveland). The Peck "Jr." rotator weighs less than 200 lbs., is powered by a 1/4-hp., 110-v. motor, will handle pipes up to 5-in. diameter. Belt transmission allows a welding-speed range of 7 to 14 in./minute.

Microclarity Filter: Commercial Filters Corp. (Melrose, Mass.) offers its new Fulflo Filter for filtration of liquids and gases at operating pressures up to 150 psi. Flow rate is 2 1/2-5 gpm. for water. The filter has a one-piece, drawn shell of Type 316 stainless steel, may be attached to 3/8- and 1/4-in. pipes. Honeycomb filter tubes are of cotton, nylon, Orion, Dacron, dynel, acetate and glass fibers, are available in a wide range of densities.

Glass Flush-Valve: The Pfaudler Co. (Rochester, N. Y.) is out with a new glass-interior flush-valve for use in the bottom outlet of glassed-steel reactors. The valve is designed to withstand the same operating conditions as the reactor, provides corrosion protection from acids (except hydrofluoric) and alkalis (at moderate temperatures). Valve has a one-piece glassed head and stem. Glass-filled Teflon seat eliminates need for lapping to maintain a proper seal. Valve comes in six sizes with 1/2- to 8-in. inlets and 1- to 6-in. outlets.

Contaminant-Free Motors: A line of motors with silicone-rubber insulation for service in atmospheres contaminated by moisture, heat, dirt, dust, etc., is now available from Allis-Chalmers Mfg. Co. (Milwaukee). The motors, rated for Class B temperature rise, are offered at the same price as its Class A motors with organic-taped and varnish insulation.

A-C has also extended its line of dielectric (electronic) heaters to cover



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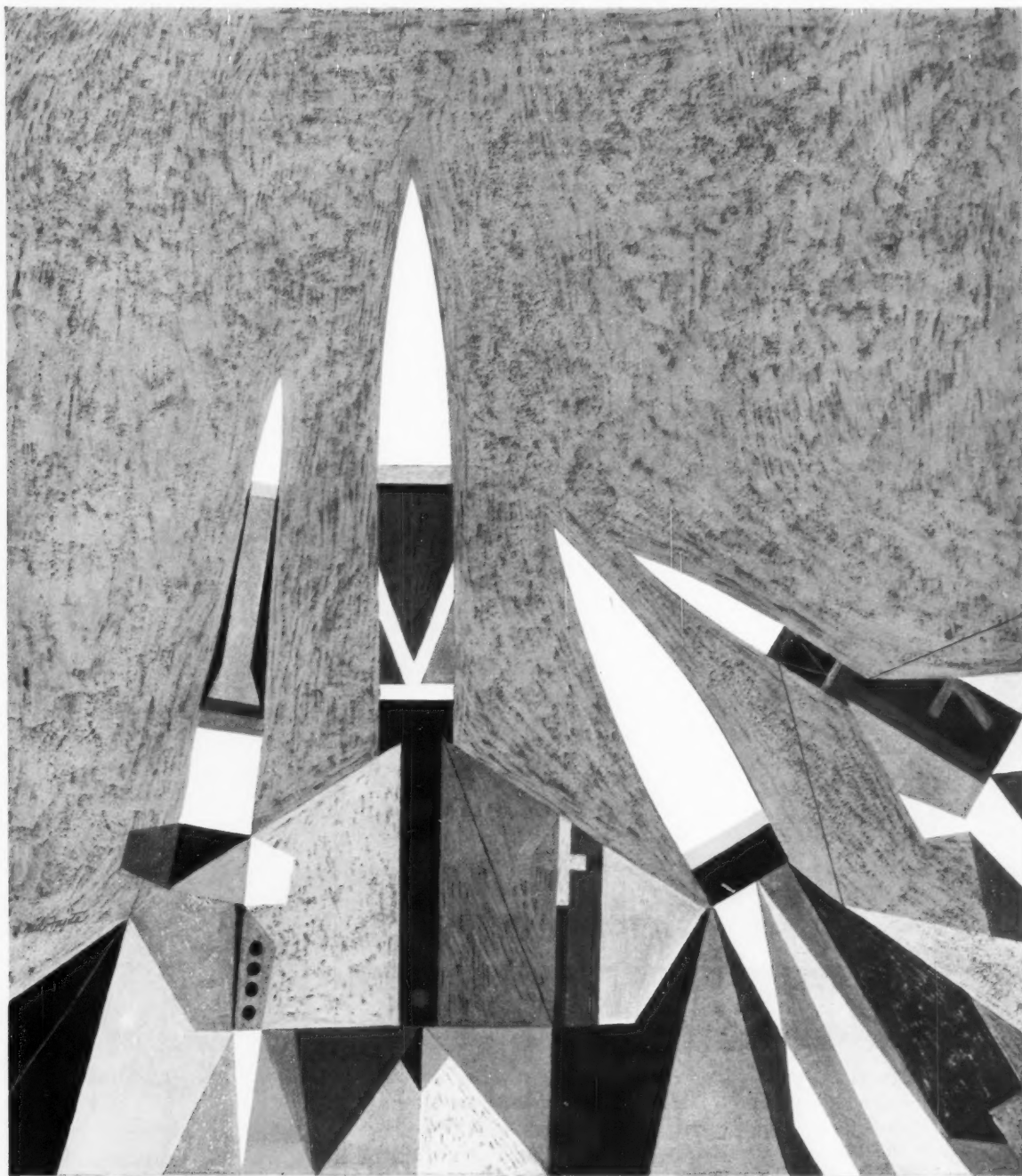
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PRODUCTION

the entire 3- to 200-kw. range. The heaters include power cubicle, oscillator section and oven are offered to replace steam for drying and curing of nonconductive materials.

Pressure Pickup: Where rugged physical conditions may be a problem, Consolidated Electrodynamics Corp. (Pasadena, Calif.) offers its new Type 4-322 differential pressure pickup for measuring sensitive pressure changes. The unit will measure differentials of ± 7.5 , ± 12.5 , ± 25 and ± 50 psi. while operating on a line with pressures up to 350 psi. CEC says the unit is less sensitive to temperature variations than most pickups.

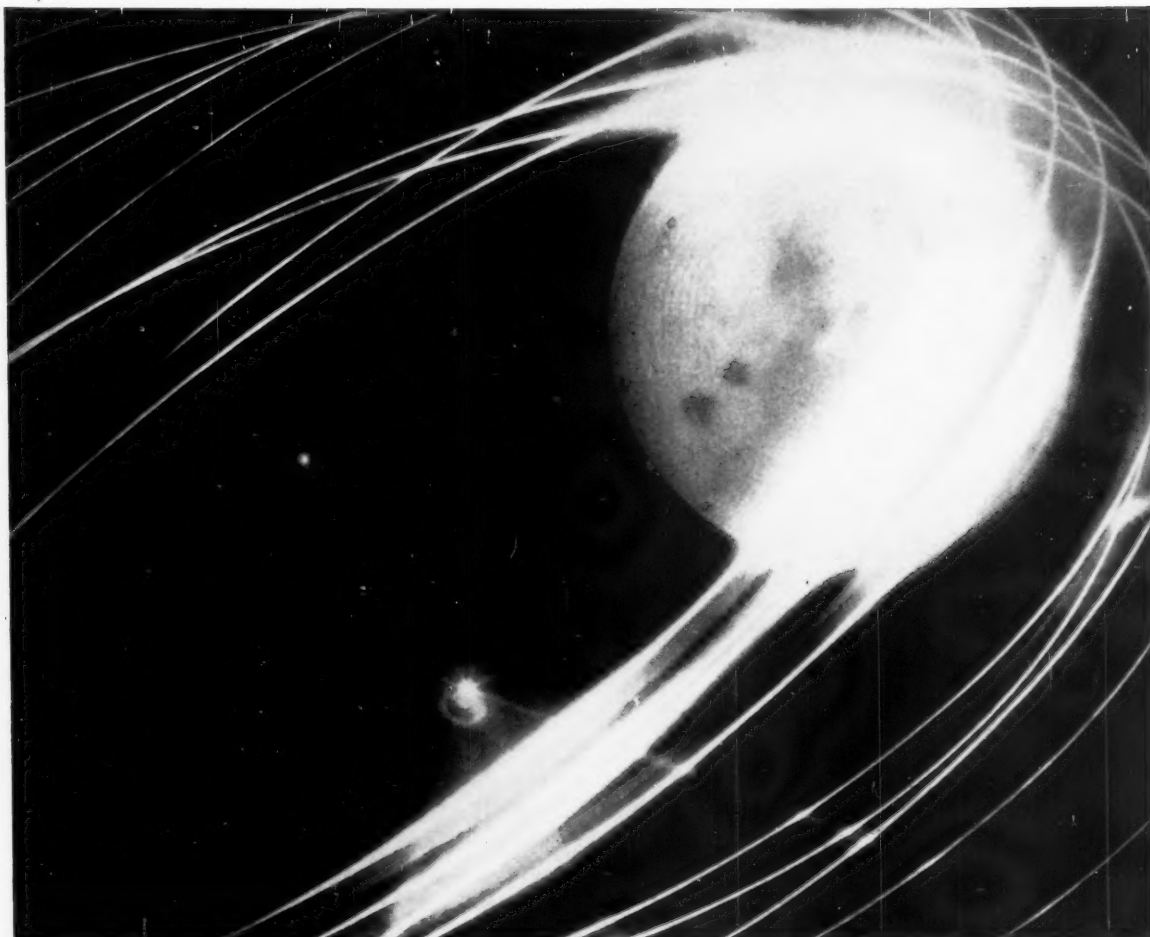
Temperature Controller: A new thermocouple temperature-control system said to eliminate errors caused by stray electrical pickup is available from Minneapolis-Honeywell's Boston Division (Boston). Model 2HCT-2, for use with standard thermocouples, is capable of control to 0.025 F. Model 2HCT-3, for use with platinum thermocouples, covers the 0 to 3000 F range with a precision of 0.1 F. Both units have a front-opening case 7½ in. high, 19 in. wide.



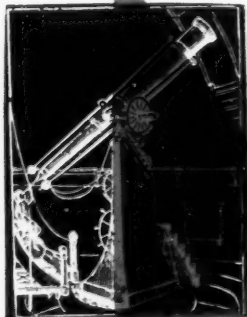
UNITED PRESS

New Spheres for Refining

These 48-ton spheres are two of five reactors recently moved by barge and truck from Wyatt Metal and Boiler Works in Houston, Tex., where they were fabricated, to Esso Standard Oil Co.'s Baton Rouge, La., refinery. They are part of the new Powerforming unit designed by Esso Research and Engineering for upgrading low-octane gasoline stocks. Bechtel Corp. (San Francisco) is prime contractor for the project.



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To meet the ever expanding market, new Crown Multiwall Bag Plants have recently been constructed—one in Antioch, California, the other in Bogalusa, Louisiana.

To keep abreast of new manufacturing concepts and new packaging ideas, Crown Zellerbach is constantly modernizing and improving its facilities.

These things all add up to the fact that Crown Multiwalls really *are* shooting for the stars—in quality, in service, in dependability. And when the time comes for space travel in its literal sense—we'll be ready for that too.

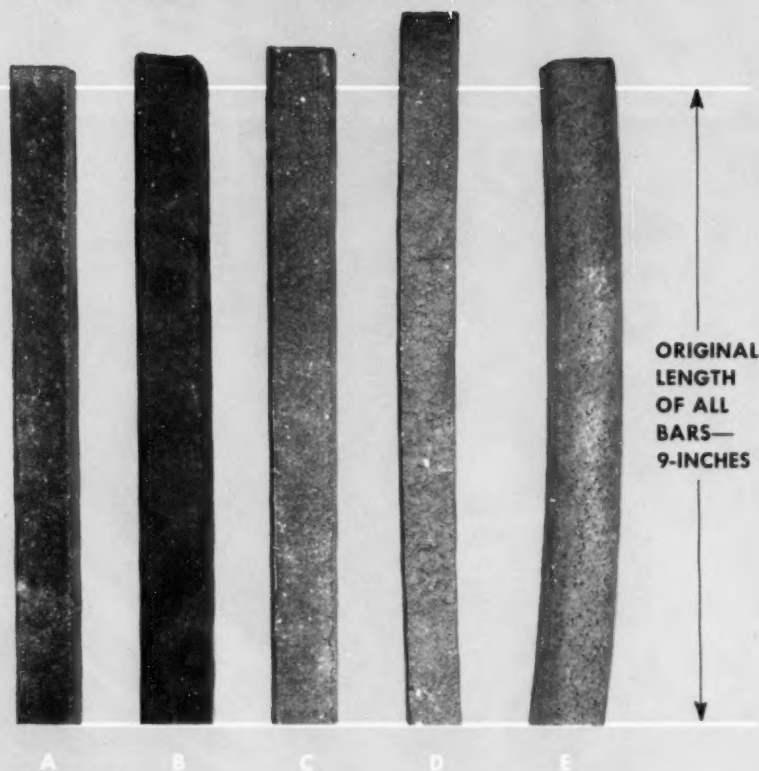


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ADMINISTRATION

German Firm's New Watch on the Rhine

More than \$60 million worth of chemical products[†] flowed through West Germany's canal network last year, bound for seaports and ultimately the United States. The 1957 total was 14% higher than that of 1956. And forecasts for 1958 indicate that another increase (possibly 10%) is in the making. A sizable portion—about 15%—of this export* business originates with a host of medium-size firms that are driving to become even more important in world chemical trade. Typical representative: Gebrüder Giulini GmbH., of Mannheim-Ludwigshafen.

Living by its executives' wits and virtually on a hand-to-mouth basis, this firm is one of the acknowledged "gap fillers" supplying semifinished products and specialties that larger companies cannot or don't desire to produce. The larger firms (accounting for 40% of all chemical exports, 35% of domestic sales) recognize the medium-size companies as a counterweight balancing the industry's production scale.

Oldest Alumina Producer: Giulini—outgrowth of a drug sales house, Maggi, Grasselli and Co. founded in 1742—claims to be the oldest alumina manufacturer in the world. The original Maggi is now West Germany's biggest soup powder producer, while Grasselli is part of the Du Pont company.

Seventy percent of Giulini's \$20-million/year sales income is from alumina, 15% from phosphates (36,000 tons, valued at \$6 million), the rest from specialties. Its specialty products (sales value: \$1 million/year) are based mainly on phosphorus, and include a meat-refining agent, phosphate fertilizers and an anti-corrosion agent for household water pipes. Its alumina specialties include fillers, activated alumina and catalysts and aluminum oxide for chromatography.

Drugs stand out among Giulini's specialties. The firm is a pioneer in the use of alumina in medicines and the originator of Acisorban, an aluminum sodium silicate used to treat gastritis and duodenal ulcers. It also produces organic compounds such as phenacetin, used in Akochinin, a quinine antipvretic drug; and hydantoin bromide, a sedative and appetite depressant.

A third group of Giulini drug specialties is based on the alkaloid reserpine, obtained from the *Rauwolfia* tree. It's marketed as a sedative and hypertension remedy in such compounds as Rivasin and Rivadescin. The *Rauwolfia*-alkaloid-containing drug Hestanine

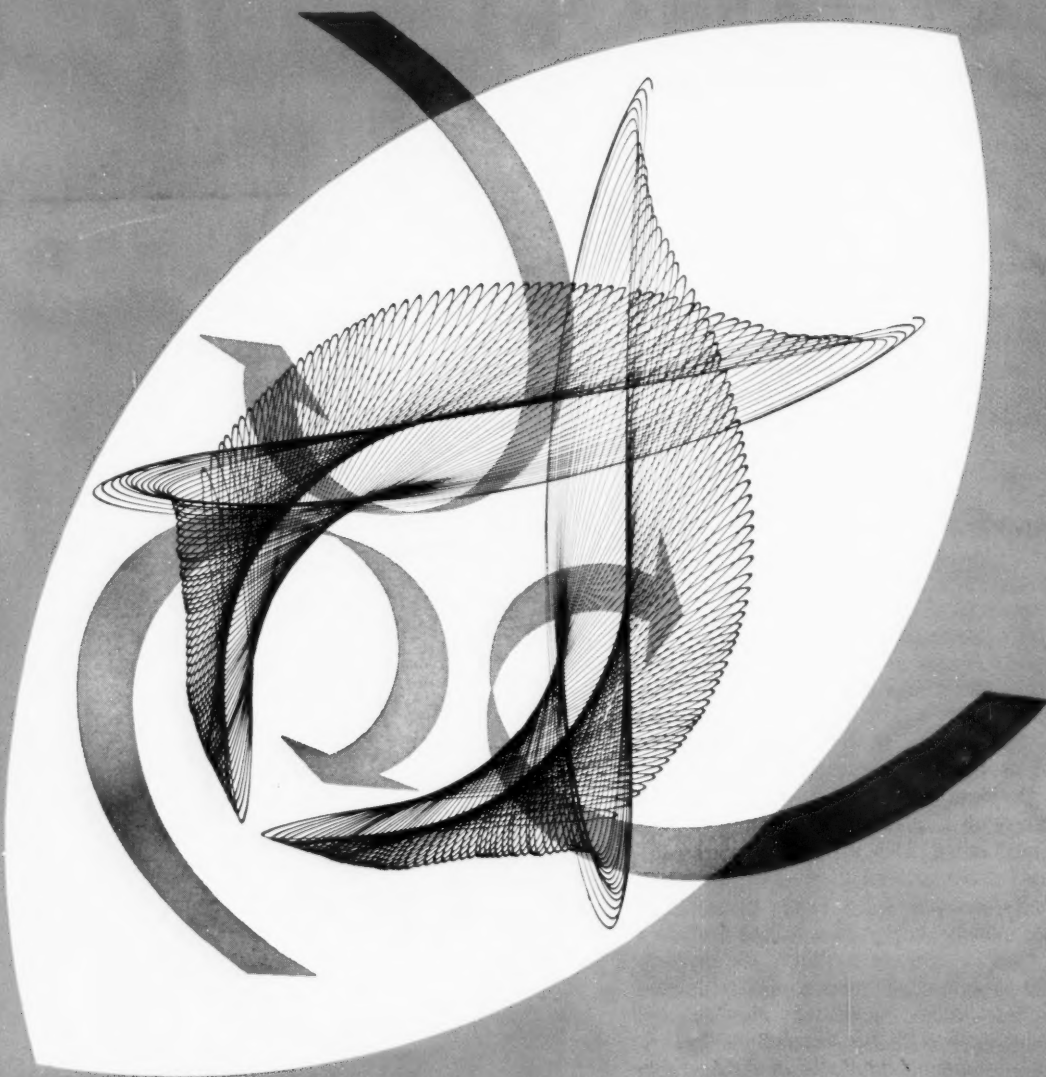
[†]Figure is for synthetic fibers, coal-tar and glass products only.

*And 17% of West Germany's domestic chemical sales.

Giulini GmbH.'s private harbor on the Rhine River.

March 22, 1958 • Chemical Week





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ADMINISTRATION

sells for \$4.75/gram, is Giulini's most expensive product.

Export Distribution: Giulini distributes its exports (30% of its \$20-million annual sales) through more than 100 agents in 70 capitals. In major European countries such as France and Holland, and also in Scandinavia, three agents are on hand—one each for alumina, phosphate and drug and specialty sales.

In several countries, particularly in South America and the Far East, Giulini has delegated representation to sales offices of one of the big West German combines.

Although Giulini has numerous international business and family connections upon which it relies heavily for business, it has only one U.S. trade agreement—with Aluminum Corp. of America. Alcoa sells about 1,000 tons/year of alumina to Giulini.

Negotiations with other U.S. concerns aren't expected, though a Giulini representative recently visited here to check sales opportunities. The company would like to export more to the U.S., perhaps make licensing agreements.

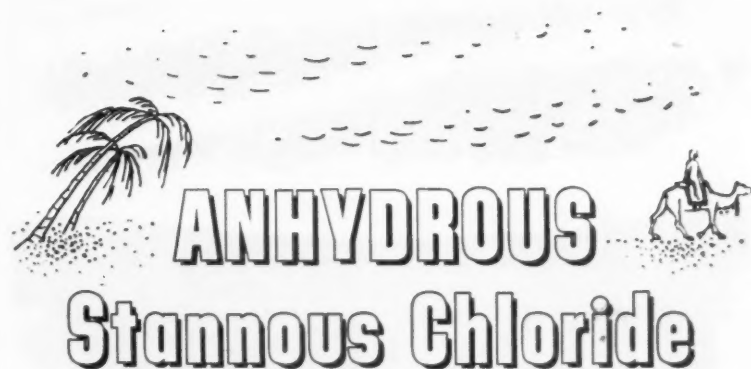
Keen Competition: For Giulini, as for most of West Germany's small and medium-size chemical companies, chief competition comes from the big combines. Alumina competition, for example, comes from state-owned Vereinigte Aluminium-Werke AG. (Bonn) and Swiss-owned Martinswerk GmbH. (Bergheim, near Cologne). To combat this, and competition in other areas, Giulini concentrates on processes that yield salable by-products.

Giulini uses the old De Ville-Pechiney-Giulini process for part of its alumina production (rated at 120,000 tons/year, now operating at 80% capacity). Although more expensive than the Bayer process, which Giulini also uses—this method yields Luxmasse* (a purifying agent for industrial and town gases). Luxmasse is exported to France, England, Austria, Belgium, Netherlands and Luxembourg.

To meet competition in phosphorus salt production—mainly from Knapsack-Griesheim AG. (a Farbwerke Hoechst subsidiary), which uses the electrothermal process—Giulini employs a wet process. This route yields by-product Siliphos, an anticorrosion agent, which is gaining acceptance.

*Named for a former Giulini sales manager.

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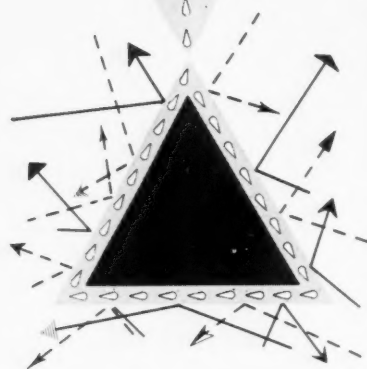
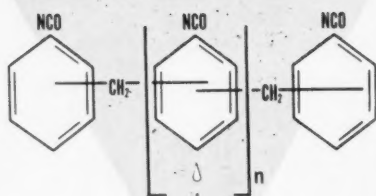
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ADMINISTRATION



Giulini plant is spawning ground for versatile executive talent.

Capital and Resources: Privately owned Giulini GmbH. is operated by the Giulini family's sixth generation. It must rely entirely on the family coffers and retained earnings for capital and resources. A GmbH. firm (a company with limited liability) is prohibited by law from using public capital. This is in contrast with an AG. company (joint stock company), which can and does resort to public stock issues.

Maintaining liquid resources without resorting to bank loans is a critical problem for Giulini management. For tax purposes, the company keeps its basic capital at a minimum.

To help solve the problem of limited liquid resources, Giulini improvises with private credit arrangements. For example, a discharge crane, recently installed to speed unloading of barges, was paid for by a shipping company. Giulini, in turn, guarantees the company labor and freight utilization for five years.

Right Man, Right Place: Direction of Giulini is entrusted to Comanagers Udo Giulini and Curt von Salmuth, who, it is said, read all the firm's business correspondence.

Both men deal with technical problems. In addition, von Salmuth supervises administration, finances and personnel affairs; Giulini manages sales and patents. A chemist and a financing expert assist the pair. There is also a purchasing director, sales director and technical expert, who are members of the assembly of directors and round out top management.

Line management is carried out by

three department managers; a director in charge of the phosphorus plant, pharmaceutical production and public relations, a director for alumina sales, and a director for technology and production.

Air-raided 19 times during the war and pressed hard by the 1954 Allied occupation law banning alumina production, Giulini had a difficult time surviving the war and postwar years. To keep its qualified personnel together—some are fourth-generation employees—the company opened a glass manufacturing plant in '47, added a resin department to serve shoe manufacturers, went into the drug and pudding-mix business.

Giulini plows back 5-6% of its sales, including 1-2% for research. It employs about 2,500 people, including 40 young lab scientists.

Common-Market Ideas: Giulini welcomes the European Economic Community (Common Market) and the proposed, broader free-trade area. The company expects the Common Market to result ultimately in fewer exports to the U.S., more competition for the U.S. in European markets. Approximately 90% of its sales will eventually be domestic or in the free-trade area, the company predicts.

Whereas the big companies are closely tied in with public interest and general economic policy, companies such as Giulini carry the burden of their own risks. As the presidents of Bayer, Hoechst and BASF recently agreed: "If a company like Giulini flourishes, the market is in good balance and healthy."

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HARRISON, N.J. • RICHMOND, CALIF. • CEDARTOWN, GA. • BOSTON, MASS. • CHICAGO, ILL. • LONDON, CANADA

March 22, 1958 • Chemical Week

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ADMINISTRATION

LABOR

Deadline Dropped: Management will be pressed this year to grant three major concessions to Oil, Chemical & Atomic Workers Union. But contrary to past practices, union officials have fixed no deadline for reaching these goals.

In a letter to staff members and local bargaining officials outlining the union's recently adopted '58 bargaining program, OCAW President O. A. Knight said lack of a fixed deadline means that the union is not committed to "an immediate opening of a large number of contracts with the resultant creation of a crisis. . . ." This, the union declares, permits various groups to probe into industry attitudes on a tentative basis.

OCAW's three main goals: wage increases of 3½% plus a cost-of-living adjustment, protection against layoffs, and longer-term contracts.

Election Ordered: Maintenance and operations employees at Allied Chemical & Dye's Nitrogen Division plant at Orange, Tex., will vote soon on union representation. The National Labor Relations Board last week ordered the election to be held within 30 days. Some 74 employees are involved, 42 in operations and 32 in the craft category.

Operating employees will choose representation by Oil, Chemical & Atomic Workers Union or International Chemical Workers Union or by no union at all.

Similarly, maintenance men, mechanics, electricians, painters, laborers, janitors and maintenance helpers, will choose among OCAW, ICWU, Pipefitters Union Local 195, International Brotherhood of Electrical Workers Union Local 390, or no union.

Pharmaceutical Pact: Bargaining committees of Merck & Co., Inc., and three locals of Oil, Chemical & Atomic Workers Union have signed agreements extending to May 1, '60, calling for average wage increases of about 12¢/hour, with renegotiations in May '59.

Other contract provisions: comprehensive health insurance at lower cost to employees and a liberalized vacation program. Plants involved: Rahway, N. J. (1,200 employees); Danville, Pa. (450), and Philadelphia and West Point, Pa. (1,100).

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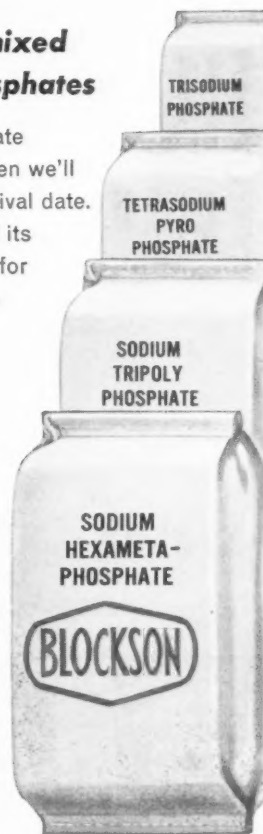
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Explosion Settlement: National Cylinder Gas Co. and its retail distributor, Mansfield Oxygen Acetylene Supply Co., have been ordered by Knox County, O., probate court to pay \$240,000 to the widows of three engineers killed Sept. 6, '55, in an oxygen-tank explosion.

The settlement gives \$90,000 each to Mrs. Marvin Frady and Mrs. Karl Knohls and \$60,000 to Mrs. Paul Humes.

Investigation revealed that the explosion, at the Cooper-Bessemer Corp. (Mt. Vernon, O.), occurred when the men used a cylinder containing oxygen that was designated as containing nitrogen (*CW*, March 10, '56, p. 54). The cylinder was supplied by the co-defendants.

Uranium Stock Sale: U.S. district court (Houston, Tex.) has granted a temporary restraining order asked by the Securities & Exchange Commission to prevent Universal Service Corp. (Houston) from selling \$750,000 in uranium stock. The SEC complaint charged that papers filed with it by the firm contain untrue statements, omit certain material facts.

KEY CHANGES

Rollin V. Hadley, Jr., to director, Corning Glass Works (Corning, N.Y.).

L. O. Crockett, to president and chief executive officer, Goodrich-Gulf Chemicals (Pittsburgh).

A. M. Gemassmer, James D. Mahoney and William W. Schneider, to directors, Mobay Chemical Co. (Pittsburgh).

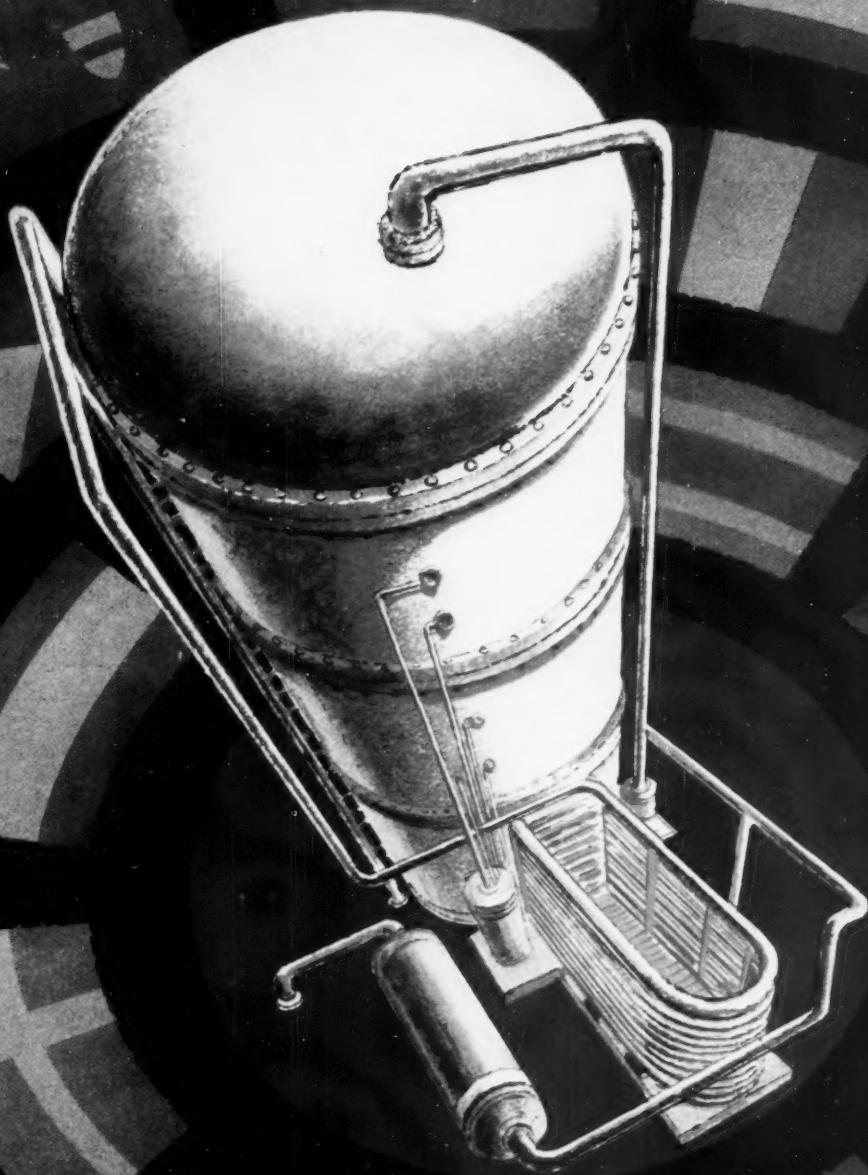
James Cox, to executive vice-president, and **Paul W. Booth,** to vice-president in charge of engineering, Hofman Laboratories, Inc. (Hillside, N.J.).

Carl Pacifico, to director, American Alcolac Corp. (Baltimore).

Lawrence A. Kimpton and F. Cushing Smith, to directors, Standard Oil Co. of Indiana.

DIED

Paul L. Swisher, 59, vice-president and director, Reichhold Chemicals (White Plains, N.Y.), at North Tarrytown, N.Y.



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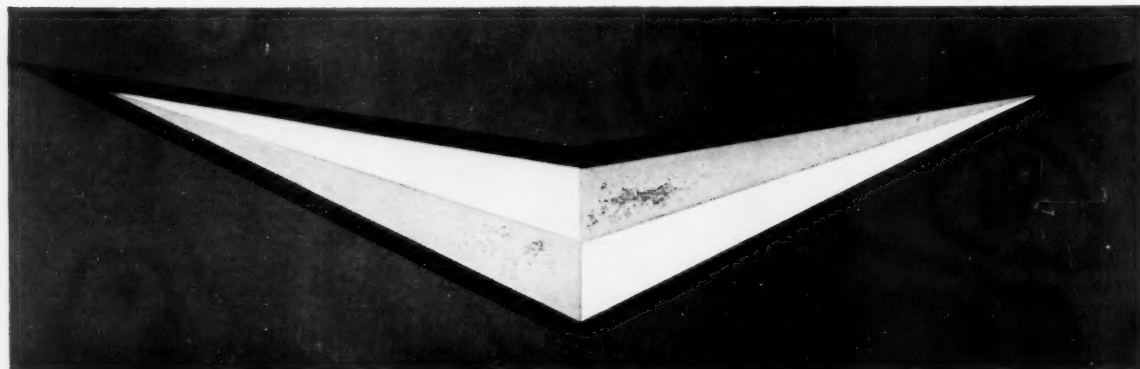
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SPECIALTIES



Lockheed's jet-prop transport—its use by airlines will mean higher standards for hydraulic fluids.

New Hydraulic Fluid on the Flight Plan

In the next few months, the aircraft industry may be offered a new fire-resistant hydraulic fluid—Union Carbide Chemical's Ucon hydrolube AC. Carbide's marketing experts are now studying sales potential preliminary to offering the new product to aircraft manufacturers, commercial airlines and CAA for developmental testing and approval. The new fluid may make Carbide a serious challenger to Monsanto, top supplier of the nonflammable fluids to the commercial aircraft and airline industry.*

Moreover, the new compound appears to be the first water-based fluid (hydrolube) to meet the airlines' rigid standards. Although several firms have offered hydrolubes before (Carbide included), Carbide feels AC is the first in which the technical problem of the water-based fluids, including decomposition of additives, cor-

*Aircraft hydraulic systems drive equipment where power demand is high or fast and frequent. Hydraulic equipment operates landing gear, control surfaces, armament and doors, propeller pitch, nose gear steering, brakes, lube-oil transfer, in-flight refueling systems, and the like.

rosiveness and instability have been licked.

The potential market for this and other new fire-resistant hydraulic fluids is quite substantial: civilian aircraft, last year, required nearly 700,000 gal. (125,000 gal. of fire-resistant fluids, 575,000 gal. of petroleum-based fluids); military craft, twice that. Although the petroleum-based fluids still hold a substantial lead, their flammable nature is of major concern to commercial airlines. (Carbide's new hydrolube is primarily for the current commercial market—military jet planes require even more specialized fluids.)

And according to the best-informed sources, the civilian aircraft requirements will be greatly expanded as U.S. airlines complete their huge expansion programs with jet craft. And the government's expanded missiles program (they have hydraulically operated control surfaces, too) should add further expansion impetus.

Developing Their Own: One of the

most active companies in the field of aircraft hydraulics is Douglas Aircraft Co., which has been working on these problems for about 12 years. One development of its project is Skydrol, on which Douglas has several patents, and which Monsanto makes and markets almost without serious competition. Skydrol has a spontaneous ignition point of about 1100 F, works well at the low temperatures encountered by current aircraft, and also at temperatures up to 225 F. It's priced at \$12/gal.; a related Monsanto product for jets, Skydrol-500, sells for \$15/gal.

Although Douglas and other aircraft makers and operators that have used Skydrol feel it's the best answer so far, it has some drawbacks: it is a plasticizer, and softens or dissolves many of the standard materials that were developed for use with petroleum-derived fluids. This means paints, insulation, leather, tape adhesives, packing and hoses must be selected for resistance to Skydrol. (This is seldom a problem with military jet

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aircraft since these planes are designed to use a synthetic lubricant, dioctyl sebacate, which is also a plasticizer, and equipment resistant to it is safe with Skydrol.)

Use (or non-use) of Skydrol is determined by the buyer of the plane, not its builder. Nonetheless, many Douglas DC-6's and most DC-7's are so equipped. Monsanto services these customers in the U. S. through its own sales organization, sells overseas through oil companies. Douglas offers its technical experience with the fluid to distributors, operators and its own competitors in the aircraft industry.

Low-Cost Challenger: Carbide says AC, a Navy-sponsored product, may be used throughout a temperature range of -65 F to 160 F. It consists of water (35%), ethylene glycol and a high-viscosity lubricant-thickener plus additives to give liquid-phase and vapor-phase corrosion protection, and lubricity. In addition to performing better than other hydro-lubes, the new AC is low in cost, a prime advantage over phosphate esters. Plans are to offer the fluid for developmental testing at about half the cost of the phosphates.

Hydrolube AC isn't expected to take the aircraft industry by storm. But its makers feel that it will provide serviceable, low-cost, fire-resistant fluid for today's aircraft and for at least the first generation of commercial jets.

Target Remains: While there are a number of products now on the market for jet hydraulic systems, makers agree that the ideal hydraulic fluid—one that combines superior fire-resistance with good high-temperature performance—still doesn't exist.

Finding the right product for jets is a real problem to makers of specialty hydraulic fluids. The products that have evolved over the years for use in conventional aircraft still leave much to be desired in the light of the severe requirements.

Silicones Next? Much of the research now being done on high-temperature hydraulic fluids centers around the silicones. As fire-resistors the silicones are better than the petroleum-based fluids and the fluids based on diesters (offered for industrial applications) but don't stand up as well as the phosphates or the hydrolubes. And the fire problem is more acute in jets than in conven-



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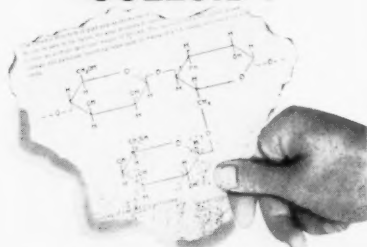
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tional planes, for two reasons: jets move faster and require more braking power when on the ground; and, unlike conventional planes, there's no propeller to blow out the small ground blazes that sometimes occur.

Another drawback to the silicones is their high cost—to date, too high for commercial airlines. But the silicones are the only fluids yet developed that will withstand the high-temperature demands likely to be found in systems that have jet equipment.

New Approaches: Another approach to high-temperature problems is the Douglas-Monsanto fluid, OS-45. An *o*-silicate ester, it is useful under conditions at higher temperatures than Skydrol (Type IV goes to 550 F), although it has a lower spontaneous ignition point (750 F). It's intended for high-speed aircraft subject to heating due to skin-friction; it's a little cheaper than silicones, at \$20/gal.

The big objection to OS-45 (currently racking up more sales as an electronic coolant than as a hydraulic fluid) is its hydrolytic instability, which sometimes results in the formation of filter-clogging silica precipitate. OS-45 may also gel if water content exceeds 10%, but makers point out that the presence of any water in a pressurized, sealed hydraulic system is highly unlikely.

The Air Force has conducted experiments with silicate dimers, and silicones with halogen additives for better lubricity and as fire-resistance, but nothing approaching a universally compatible, all-temperature hydraulic fluid has been reported.

Oronite Chemical (San Francisco), subsidiary of Standard Oil of California, is now offering two compounds developed in the Air Force-sponsored research program. They are based on polyalkoxy siloxane (a type of silicate ester)—are called Oronite High-Temperature Hydraulic Fluids 8515 and 8200. These compounds reportedly can be used successfully in a temperature range from —65 F up to 550 F. However, the compounds, priced at \$25/gal., are primarily for supersonic aircraft and missiles. Their superior properties along with premium price are simply not required for present commercial jet aircraft.

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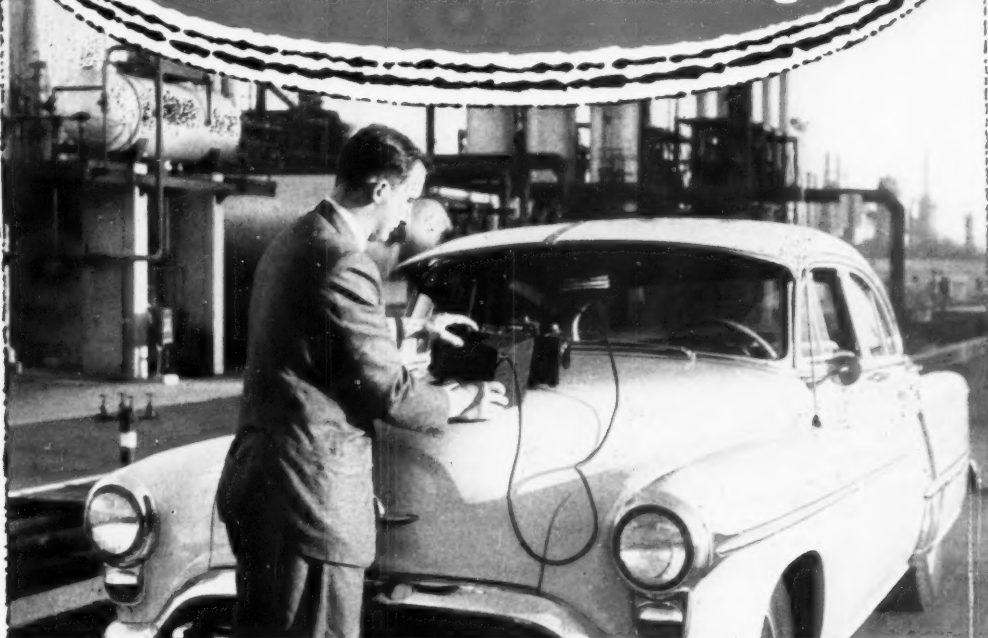
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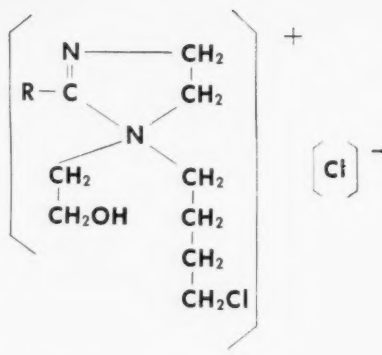
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SPECIALTIES

has many others still in the development stage. Its now-available product, called Versilube F-50, is a methyl-chloro-phenyl polysiloxane. Versilube was improved last November by adding a tin polymer. This tin polymer, for which a patent is pending, gives the fluid added high-temperature lubricity.

Developed primarily for jets and missiles, Versilube operates efficiently up to 575 F, but at temperatures above this, begins to lose its lubricity. GE points out, however, that at temperatures above 500 F, the problem is more mechanical than thermal. According to GE, "The aircraft industry has design and metal problems to overcome as well as fluid problems." Price of Versilube is \$45-\$50/gal.

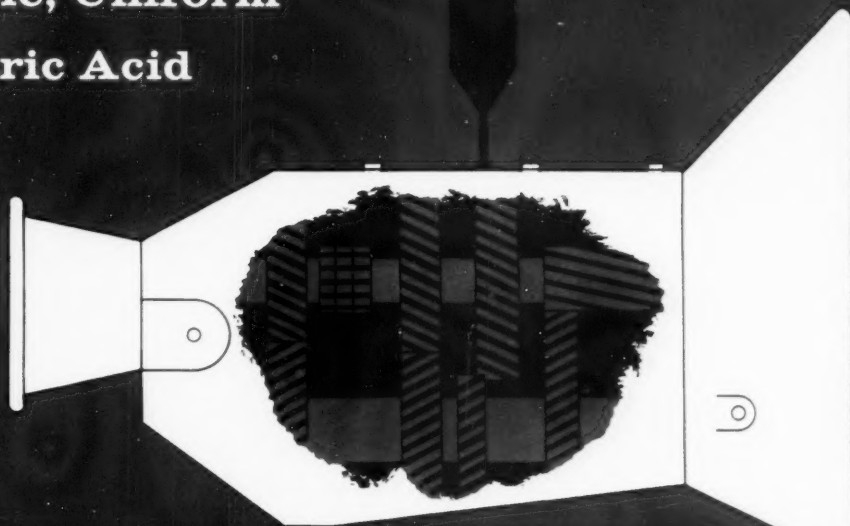
Dow Corning has a high-temperature chlorinated silicone (F-60) in the works too. Although it was first offered about eight years ago, it's still undergoing tests. Temperature range of Dow Corning's silicone is from -65 F up to 550 F. It is selling at \$38/gal.

R. M. Hollingshead (Philadelphia) is also now working on a high-temperature synthetic fluid. (About five years ago Hollingshead marketed a hydrolube but withdrew it from the market.) And Bray Chemical Co. (Los Angeles) has submitted Royco, a mineral oil with silicate additives, to Wright Field for testing. Both Shell and Monsanto are reportedly researching polyaryl ethers for use in high-temperature hydraulic systems.

Because they lack better hydraulic fluids, aircraft manufacturers now take a number of special precautions. Extra fire-extinguishing systems are included in designs; hydraulic lines are routed around electrical equipment and other hazardous areas, and on-the-ground operations require special care. Even these precautions won't preclude suits for negligence in the event a serious hydraulic fire should occur.

According to the latest reports, the DC-8, the Convair 880 and the Boeing 707 will all have Skydrol-500 systems as standard. However, the consensus of the aircraft industry, including Douglas, is that any hydraulic fluid approaching closer to the ideal will be received with open-minded, but cautious enthusiasm, and that's all the encouragement Carbide and the others need.

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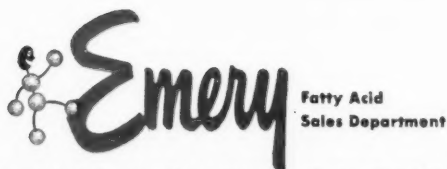


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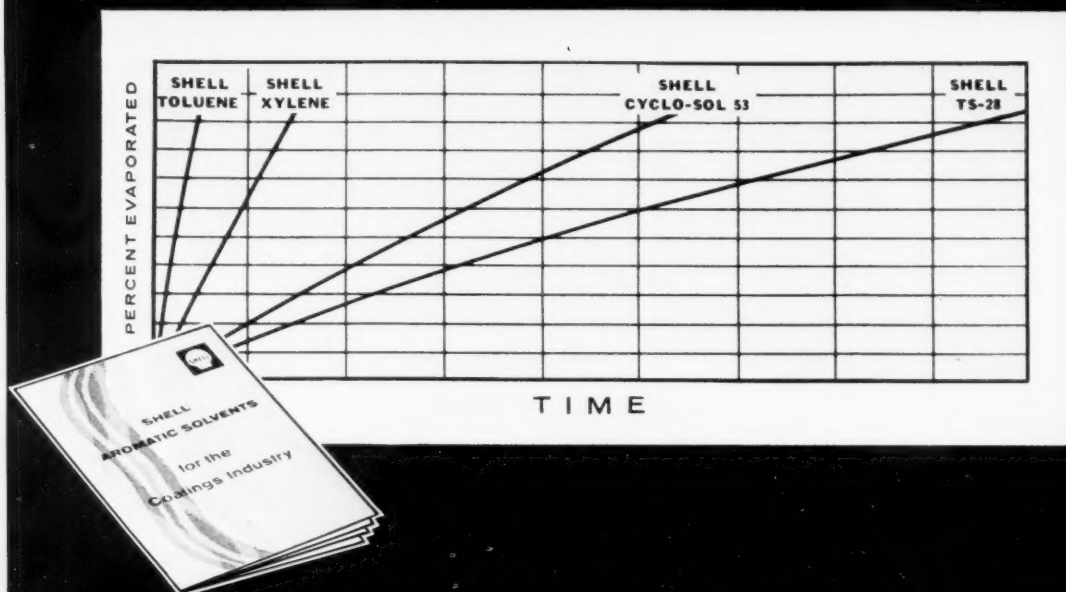
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Technology

Newsletter

CHEMICAL WEEK

March 22, 1958

Du Pont will bolster its paper-from-synthetic fiber research in pilot-plant facilities leased from Riegel Paper Corp. Riegel personnel will operate the equipment; Du Pont will pass along research results to paper-makers.

•
The prospects and problems of pyrophoric fuels (liquids that ignite spontaneously in air) for commercial and military use were highlighted this week at the aviation conference of American Society of Mechanical Engineers and American Rocket Society. R. A. Wells, staff engineer for Gulf Research and Development Co., reported that, for jet planes, the pyrophorics seem to produce better over-all results than any other type of fuels tested so far.

Three pyrophoric materials under examination are: triethyl aluminum (TEA), triethyl boron (TEB) and trimethyl aluminum (TMA). Their chief advantages, according to Wells: they can be produced in large volumes at reasonable prices; they permit the use of a smaller, less complicated and more reliable engine than is possible with conventional fuels. They also virtually eliminate the problem of jet-engine "flameout" in thin air.

Unfortunately, as Wells pointed out, these promising fuels also have some serious drawbacks: TEA and TEB are extremely destructive to living tissue, react violently or even explode on contact with water or hydrogen-containing compounds. Suitable packaging could overcome many of these problems, Wells said. But the Navy doesn't favor materials that react with water.

•
Novel flame reaction for making high-density uranium dioxide was a processing highlight of this week's Nuclear Congress in Chicago. C. D. Harrington and A. E. Ruehle, both of Mallinckrodt Chemical Works (St. Louis, Mo.), reported that crystalline UO_2 can be produced by the new technique directly from uranium trioxide, or uranyl nitrate. The dioxide in powdered form (the product used in conventional cermet) never appears as an intermediate.

Key to the flame reaction is the stability of dioxide above 2400 F. A methane or hydrogen flame, or an atomic hydrogen arc, decomposes the trioxide or nitrate starting material into the dioxide. The feed material enters the fusing zone through a tube; fused dioxide crystallizes into a dioxide rod, which is mechanically lowered as it grows.

Though mechanical control required to grow large crystals hasn't yet been perfected, say Harrington and Ruehle, the method may eventually permit direct production of solid-fuel elements. Advantages of the fused dioxide: it has extremely high density (approaching the theoretical X-ray density of 10.97); individual crystals are fairly large (1-5 mm.), are expected to provide better heat transfer than compacted and sintered powders of small crystal size.

Technology

Newsletter

(Continued)

Uranium dioxide was also a topic of interest at the concurrent Atomic Energy Management Conference cosponsored by Atomic Industrial Forum and National Industrial Conference Board. W. B. Lewis, vice-president of Atomic Energy of Canada, Ltd., said that the ability of UO_2 to withstand irradiation makes it a promising prospect for low-cost, high-burnup nuclear fuel.

•
Can improved technology halt the shrinking use of coal as a chemical raw material? That improvements are needed is made clear by Olin Mathieson's decision to discontinue operations at Morgantown, W. Va., where it has experienced serious operating losses for two years. OM reduced production of ammonia and methanol at the plant in Jan. '57, will now halt the coking operations it had maintained.

But there are still two rays of hope for coal:

OM is still testing The Texas Co.'s process for partial oxidation of solid fuels (*CW*, June 30, '56, p. 76). A commercial-size unit is in experimental operation at Morgantown.

Philadelphia & Reading Corp.'s test gasifier for producing hydrogen and synthesis gas from anthracite silt has been completed, after long delay. PRC's president, Howard Newman, last week told stockholders that the unit, built by Hydrocarbon Research, Inc., at Trenton, N. J. (*CW Technology Newsletter*, Aug. 25, '56), may determine the technical and economic feasibility of the process before the end of '58.

•
Evidence of advances in titanium welding techniques made in the past few months comes from Convair (division of General Dynamics) this week. Titanium hemispheres, welded together to form spherical pressure vessels for storing helium at -300°F , will be used in the Atlas missile to help control propellant flow. Spheres must be able to withstand internal pressure of 5,000 psi. Only a year ago, some fabricators were worried about weakness of titanium welds caused by air embrittlement.

•
Methylene blue markedly increases the antituberculosis activity of certain drugs, according to researchers at the Medical High School in Debrecen, Hungary. Only half the normal dose of isoniazid (isonicotinic acid hydrazid) is required, they report, when the drug and dye are combined. The Hungarians theorize that methylene blue base (long known to have anti-TB properties itself) sets the stage for other drugs by sequestering magnesium essential to TB bacilli growth.

•
Pyroceram, Corning's crystalline glass, is now in commercial production as tubing and plate. The tubing is currently undergoing tests in heat exchangers. Ball-bearing parts and pistons made of the material are also under study.



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Rubber and drug companies form shipper's groups to cut less-than-carload-lot shipping costs:

- Participating companies send small shipments to designated terminals.
- Hired agents consolidate goods into carload lots for shipment by common carrier.
- Merchandise travels at lower, volume-shipment freight rates to specified distribution terminal.
- Agents at terminal unload, sort and deliver orders to customers.
- **RESULT:** Savings up to \$1/100 lbs. of goods shipped.

Goal: Lower Freight Bills

Rubber and pharmaceutical manufacturers are this week organizing shipping systems designed to sharply slash the rising cost of less-than-carload-lot (l.c.l.) traffic. Both groups plan to establish "shipper's associations" that will provide facilities for pooling l.c.l. shipments to take advantage of cheaper, full-carload and truckload freight rates.

Rubber Shippers Assn., a nonprofit offspring of Rubber Manufacturers Assn., has already come into formal existence. Within the next few weeks, New England rubber goods producers will start funneling l.c.l. shipments to West Coast customers through conveniently located consolidating and sorting terminals. When extended to the entire industry, the procedure (see above) will produce multimillion-dollar annual freight savings.

Drug companies are not so far advanced in planning their similar type of operation. But that idea was top item on the agenda of the Drug and Toilet Preparations Traffic Confer-

ence's* midwinter meetings held recently in New York.

Though the group took no immediate action, a spokesman told *CW*: "It's a foregone conclusion that the drug and toilet people will set up a shippers group to combat inflating transportation costs before the end of 1958."

Cost Incentive: Since '46, rubber manufacturers have watched their freight charges spiral 170%. Today, they pay out \$300 million/year to move their merchandise to market. Firms shipping l.c.l. are especially hard hit; they pay a premium charge on shipments. "In certain instances," points out one traffic executive, "present transportation costs come ridiculously near to exceeding the invoice price of the merchandise shipped."

Rubber Shippers Assn. is incorporated, has a nine-man administrative board and a small executive staff. The New England tryout, says RSA board chairman George Gwinup, is the opening phase of a national organization.

Initially, about 180 New England rubber manufacturers are expected to

join the group. They ship 40 million lbs./year of freight to the West Coast. Their l.c.l. cargoes are comprised of bowling balls, auto tires, garden hose, etc., eventually will include synthetic resins and chemicals. The cargoes will be handled by RSA agents at East Coast consolidating terminals at Boston, Worcester and Springfield, Mass., Providence, R. I., and Bridgeport, Conn. RSA agents on the West Coast will operate distribution terminals at Seattle, Portland, Los Angeles and San Francisco.

Once this phase of the pooling plan gets rolling, RSA plans terminals for New York, Trenton, Philadelphia, Baltimore, Buffalo, Akron, Cleveland, Detroit and Chicago. And thereafter, terminals will spring up wherever tonnage warrants. Eventually, RSA hopes to include and service all of the country's 1,800 or more rubber manufacturers.

Freight savings to individual companies will vary with frequency of shipment and distance. But as a "rule of thumb," one industry observer estimates the scheme should produce savings of 50¢ to \$1/100 lbs. for each participating firm. Similar savings have been made in other industries (retailing, canned foodstuffs, etc.).

Rising Interest: Elsewhere in the chemical process industries, the practice of pooling l.c.l. shipments to pare freight costs is catching on fast. Some drug firms are using the idea right now. American Home Products, Bristol-Myers and Sterling Drug consolidate their l.c.l. freight in the New York-New Jersey area for shipment to New England markets. More than 50,000 lbs./day are pooled at savings averaging more than \$1/100 lbs.

Chemical specialties companies also now are making limited use of pooling, but on an informal basis; shipments are combined with those from other industries in the area.

Some chemical firms, such as Harshaw, often pool the freight destined for various customers in a given area. A cartage company, under contract, does the physical job of distributing carload and truckload orders. Harshaw saves up to \$200/truckload.

If the drug and rubber companies' setups prove as successful in cost-cutting as expected, it's a sure bet that other industries will try it too.

*An association comprised of traffic executives from more than 100 firms. It acts with the backing of American Pharmaceutical Manufacturers Assn., Proprietary Assn., American Drug Manufacturers Assn., and Toilet Goods Assn.

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SALES

Now: Group Consulting

"Group consulting"—a form of service that provides specialist consultants to handle all specific phases of a project and coordinates their activities—will get full-scale trial in the commercial chemical development field this year. Newly formed Com-Dev, Inc. (Philadelphia), plans to bridge the gap between technical specialists and management consultants.

Specialist-type counselors, believes Com-Dev's chief, C. E. Silling, Jr., confine themselves to a limited range of activity; factory designers, for example, would not attempt to handle a research project. And general management consultants are reluctant to handle technical aspects of a chemical development program.

Com-Dev, says Silling, will provide a complete commercial development service and program administration on a consulting basis by using its own staff of specialists in chemical marketing, technology, commercial development, finance and law, supplemented by outside consultants. Its four-point service:

- Determine specific commercial development needs of the client and propose a specific program for it.
- Secure services of specialist consultants to study markets, run research programs, etc.
- Administer and integrate the entire development program.
- Turn over to the client a "full, going business."

Silling envisions four advantages of the service: faster project and program development; reduced capital investment requirement; elimination of the client's need for a commercial development staff; provision of a means for centralizing a development or diversification program.

Silling's firm will, in practice, test the chemical industry's need for the group consulting approach. A demand for group consulting has been found in other fields such as investment banking and personnel relations. And the participating companies have overcome problems in winning customer confidence and the cooperation of outside technical specialists.

Com-Dev's success, of course, will depend upon its ability to deliver the savings and services it promises. And any such success will encourage the other broad-service consultants to promote similar services.



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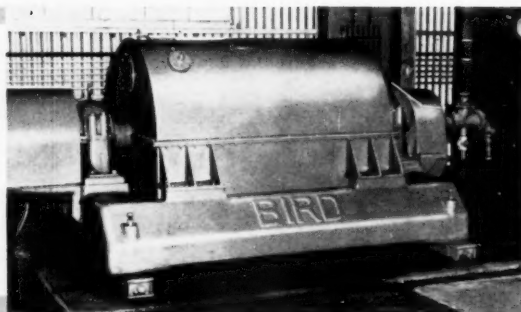


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Market Newsletter

CHEMICAL WEEK
March 22, 1958

Earlier signs of vinyl industry new capacity are firming up. As predicted in *CW's* Special Market Report on vinyls last fall (Nov. 16, '57, p. 93), Ethyl Corp., a newcomer to the monomer field, now has its "newly completed chloride monomer plant (in Baton Rouge, La.), in operation."

Although Ethyl is still reluctant to reveal any capacity data, it's a safe bet that the installation (said to be the first in Louisiana to turn out commercial quantities) could produce some 60 million lbs./year of vinyl chloride monomer. The expansion boosts total U.S. capacity to about 865 million lbs./year.

But that figure will be raised soon by another 50 million lbs. That's the estimated capacity of Diamond Alkali's abuilding monomer plant at Deer Park, Tex. The new installation was slated for operation this quarter, but a revised timetable now reads "midyear."

•
Chlorine-caustic capacity was "more than doubled" at Solvay Process Division's (Allied Chemical) recently expanded Brunswick, Ga., plant. Last week, Solvay was making first shipments of 70% caustic soda liquor, will continue to supply 50% material in barge or tank-car lots.

The 70% material is available, says the company, in regular and rayon grades, is being shipped in 10,000-gal. tank cars, f.o.b. Brunswick basis, freight equalized with "recognized producing points."

Another new caustic-chlorine plant is operating at "full capacity" this week. It's Kaiser Aluminum & Chemical's \$8-million unit at Gramercy, La. Kaiser's facility, which can turn out 114 tons of caustic and 100 tons of chlorine daily, is being touted as "the first such plant built in the U.S. to supply caustic to an adjoining alumina works." (Caustic is used by the aluminum industry to refine bauxite into alumina.)

Production at Gramercy, adds the company, also is sufficient to supply a "substantial portion" of the caustic requirements at Kaiser Aluminum's Baton Rouge alumina plant and in the Chalmette, La., reduction works for making synthetic cryolite.

The new plant's chlorine output is being purchased and marketed by Olin Mathieson under a long-term contract.

•
That \$10/ton hike in dry caustic soda prices will go into effect April 1 for just about all buyers; Westvaco's initial move late last week is being matched industry-wide, although some makers haven't yet notified all customers. The increase works out to 50¢/cwt. on the fused forms of caustic in all containers.

Market Newsletter

(Continued)

Westvaco's action came as somewhat of a surprise to market followers—many believed that the current downturn in business would have exerted a postponing effect. But the reason for the change is plain: higher costs of manufacturing (fuel, freight, labor, packaging) have pushed expense of solidifying caustic close to the non-profit line.

Bulk of the caustic sold domestically is in liquid form, so the change in dry prices should have little effect on the U.S. market; the increase will be felt in export outlets, however, since virtually all the caustic shipped out is fused material.

The new upcoming schedules peg c.i. price for flake (in 400-lb. drums) at \$5.20/cwt. (up from \$4.70); and \$4.80/cwt., c.i. in 700-lb. drums. These are typical tags, and the usual differentials for other containers and l.c.l. quantities hold.

U.S. titanium sponge capacity will be chopped 6,000 tons/year.

Soon to step out as a producer, and likely to be dissolved as a company, is Cramet, a jointly owned Republic Steel-Crane Co. subsidiary. Arrangements have been made for the firm's \$25-million sponge plant at Chattanooga (built with government funds in '53) to be turned over to General Services Administration, but details on terms haven't been revealed.

Republic emphasized, however, that it will continue producing titanium mill products at its expanded Canton, O., plant, although the installation is operating at a reduced rate.

The Cramet pull-out is the second in less than a year; in mid-'57, Dow closed down "a 5-tons/day pilot plant" that had been working under a GSA contract to produce 1,000 tons/year of sponge.

Although industry disenchantment with titanium hasn't ended,

production (about 34.5 million lbs. last year) has been running at more than triple the rate of demand, chiefly because of the military's slough-off of the erstwhile "wonder metal." It's the reason, too, why sponge prices have spiraled down to a current low of \$2.25/lb., less than half the late-'54 tag.

Nuclear-grade zirconium sponge shipments to AEC have started,

says major producer Columbia-National. (The company holds a \$22,750,000 contract to supply 3.5 million lbs. to AEC over a five-year period.)

Much of the metal will be used by the government in the construction of reactors for the Navy's atomic-powered fleet. But in addition to the 700,000 lbs./year headed for AEC needs, Columbia-National's new plant near Pensacola, Fla., can also produce "up to 800,000 lbs./year for civilian reactors manufactured by private industry."

Shipments of commercial-grade zirconium began about five months ago, and the lower-cost material is filtering to the chemical processing and other industries because of its high corrosion-resistance.



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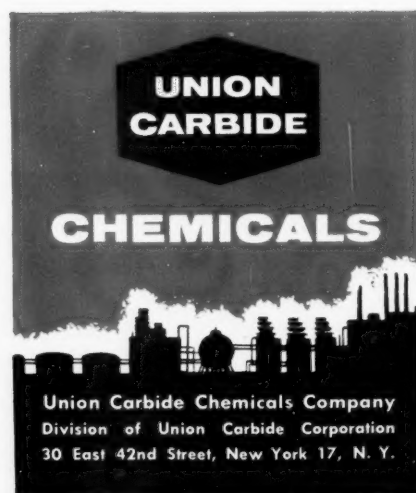
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MARKETS

Italian chemical producers sell to:

	Value in '56 (million dollars)	Percent of total exports
United States	12.1	8.90
France	10.8	7.93
Austria	10.2	7.55
India	8.1	6.03
West Germany	7.7	5.60
Communist China	6.9	5.14
Yugoslavia	6.7	4.97
United Kingdom	5.8	4.30
Switzerland	4.7	3.49

... and buy from:

		Percent of total imports
West Germany	52.4	27.78
United States	40.5	21.14
United Kingdom	26.9	14.00
Switzerland	18.2	9.52
France	16.0	8.33
Netherlands	10.0	5.24

Italy Plans to Turn the Import-Export Table

U.S. chemical exporters can expect the Italian chemical industry to spark intensified competition in world markets. Italian economists—now more than a little uneasy about their country's persistent, worsening, imbalance of hefty chemical imports and slim exports—are urging an all-out campaign for stepped-up foreign sales.

U.S. chemical producers would likely be hardest hit by it. The U.S. is now Italy's leading customer and second most important supplier of chemical products. But, actually, the U.S. sells far more chemical products to Italy than it buys, is therefore a major contributor to Italy's worrisome trade imbalance.

The U.S. is not, of course, the sole cause of those trade troubles. Adding to Italy's problem is a parallel trade imbalance with member countries of the European "Common Market" from which, in '56, it obtained 43.5% of its chemical imports—and to which it sold only 17% of its exports.

Organics Important: The over-all trade situation Italy hopes to alter is clearly defined in a just-released report on Italy's chemical industry prepared by the Business & Defense Services Administration of the U.S. Dept. of Commerce. This analysis can be updated with Com-

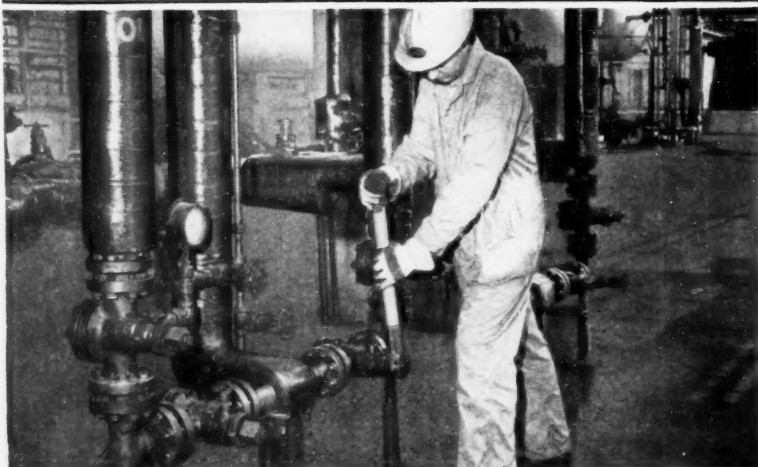
merce's own figures of chemical shipments between Italy and the U.S.

The U.S., the report reveals, is Italy's top supplier of organic chemicals and pharmaceuticals, second most important supplier of inorganic chemicals (West Germany leads), and third important in plastics and synthetic resins (West Germany and United Kingdom are ahead of the U.S.).

This country is first on Italy's list of buyers of organic chemicals, plastics and synthetic resins; it is also Italy's third-best customer for inorganic chemicals (Austria and Greece lead), and fourth-best for pharmaceuticals (best buyers are India, Yugoslavia and Egypt.)

Raw Materials: The U.S. is also the leading purchaser of Italian raw materials; next are the United Kingdom and West Germany. In '56, the BDSA report shows, Italy's raw-materials exports included 62,546 metric tons of fluorspar (worth \$1,167,000); 39,430 tons of talc (\$1,255,000); 30,533 tons of barites (\$245,000). Italy's imports included 1,462,472 metric tons of natural phosphorite for fertilizers (worth \$14,861,000); and 16,136 tons of boron minerals (\$654,000).

During the past few years, BDSA notes, the U.S.



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MARKETS

has been taking about 70% of Italy's fluorspar exports, 37% of its talc, 60% of its barite shipments. Meanwhile, the U.S. has been providing 8.2% of Italy's imported phosphorite, 82% of its purchased boron minerals.

Statistics Muddle: U.S. chemical exporters lament that the Italian import/export data reported by BDSA (mostly from Italian sources) cannot be satisfactorily cross-checked with data from the U.S. Dept. of Commerce's own files. Where comparisons appear to be possible, differences are numerous and large. At least some of the variances, say BDSA spokesmen, are caused by different methods of classification used by Italian and U.S. agencies.

Case in point is the pharmaceuticals import/export picture. Italian imports of pharmaceuticals, according to BDSA's figures from Italian sources are increasing at a much higher rate than are exports. U.S. Dept. of Commerce statistics give a different picture.

Here's the case based on BDSA figures: Imports jumped from 5,962 metric tons in '54 to 11,114 tons in '56; in the same period, Italian drug exports increased from 2,253 tons to only 2,756 tons. The U.S. is rated as Italy's leading supplier and fourth-best customer of pharmaceuticals. In '55 and '56, U.S. products accounted for 35% and 30%, respectively, of Italian pharmaceutical imports, were valued at \$8.3 million and \$9.2 million, respectively. Italian drug exports to the U.S. were valued at a relatively small \$1.4 million in '55 and a significantly lower \$913,000 in '56.

And, for that U.S.-Italian segment, here are USDC figures: Value of U.S. medicinal and pharmaceutical preparations exports to Italy in '56 is put at about \$7.5 million—at least \$1.7 million less than reported by BDSA. Value of U.S. imports is \$59,000—considerably less than the \$913,000 total provided by BDSA's sources.

Recent Trends: USDC® figures can also be used to make the U.S.-Italian chemical trade picture more current—since the BDSA report covers the

*Estimated '57 sales values are based on data for the first 11 months. Categories lumped together for total U.S. chemical products exports to Italy include certain coal-tar products, drugs, specialties, industrial chemicals, pigments, paints, varnishes, fertilizers, soap and toilet preparations and miscellaneous. Import data is similar but eliminates specialties, includes explosives, fireworks.

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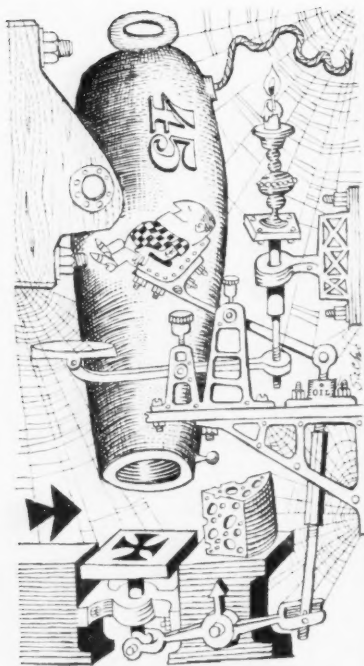
acetic acid
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n-butyric acid
isobutyric acid
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2-ethyl isohexoic acid
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MARKETS

period up to '56 only. The data is not strictly comparable, but it does indicate the general direction taken by Italian-U. S. chemical trade in the past.

Value of U.S. chemical products exports to Italy in '57 amounted to an estimated \$43.3 million, considerably more than the near-\$34 million reported for '56. All categories gained, but the biggest increase was in chemical specialties, which leaped from about \$10.9 million to more than \$17 million.

Other increases in '57, compared with '56 exports: coal-tar products, from \$2.9 million to \$3.8 million; pharmaceuticals, from \$7.5 million to \$8.1 million; industrial chemicals, from \$6 million to \$7.2 million; pigments, etc., from \$5.2 million to \$5.5 million; fertilizer materials, from \$1.2 million to \$1.4 million; miscellaneous, from \$92,400 to \$123,200.

U.S. chemical imports from Italy, on the other hand, remained about the same—possibly declined slightly—from the \$8.8 million worth shipped in '56. Imports of coal-tar products jumped from \$1.16 million in '56 to an estimated \$2.28 million in '57. Also up were fertilizer materials, from \$557,766 in '56 to near \$1 million in '57. Industrial chemicals dropped off—from \$6.5 million in '56 to about \$4.6 million in '57.

Incidentally, this data further underscores the differences between Italian and U.S. statistics. For example, USDC set the total value of '56 chemical product imports from Italy at \$8.8 million. BDSA's report indicates \$12.1 million. Neither figure is necessarily incorrect. But the difference emphasizes that merging of U.S. and foreign market data is hazardous.

Crisis Ahead? Italian chemical market observers are divided in their views about the nation's future competitive position in world chemical markets. That the more powerful Italian chemical firms are optimistic about their ability to meet a strengthening competition should be a particular warning to U.S. firms.

On the other hand, Italian Chemical Assn. spokesmen fear more competition from the U.S. once the Common Market tariffs are effective.

Thus, intensive development of "other foreign markets" is inevitable. And in this respect at least, U.S. chemical makers are bound to feel Italy's bid.

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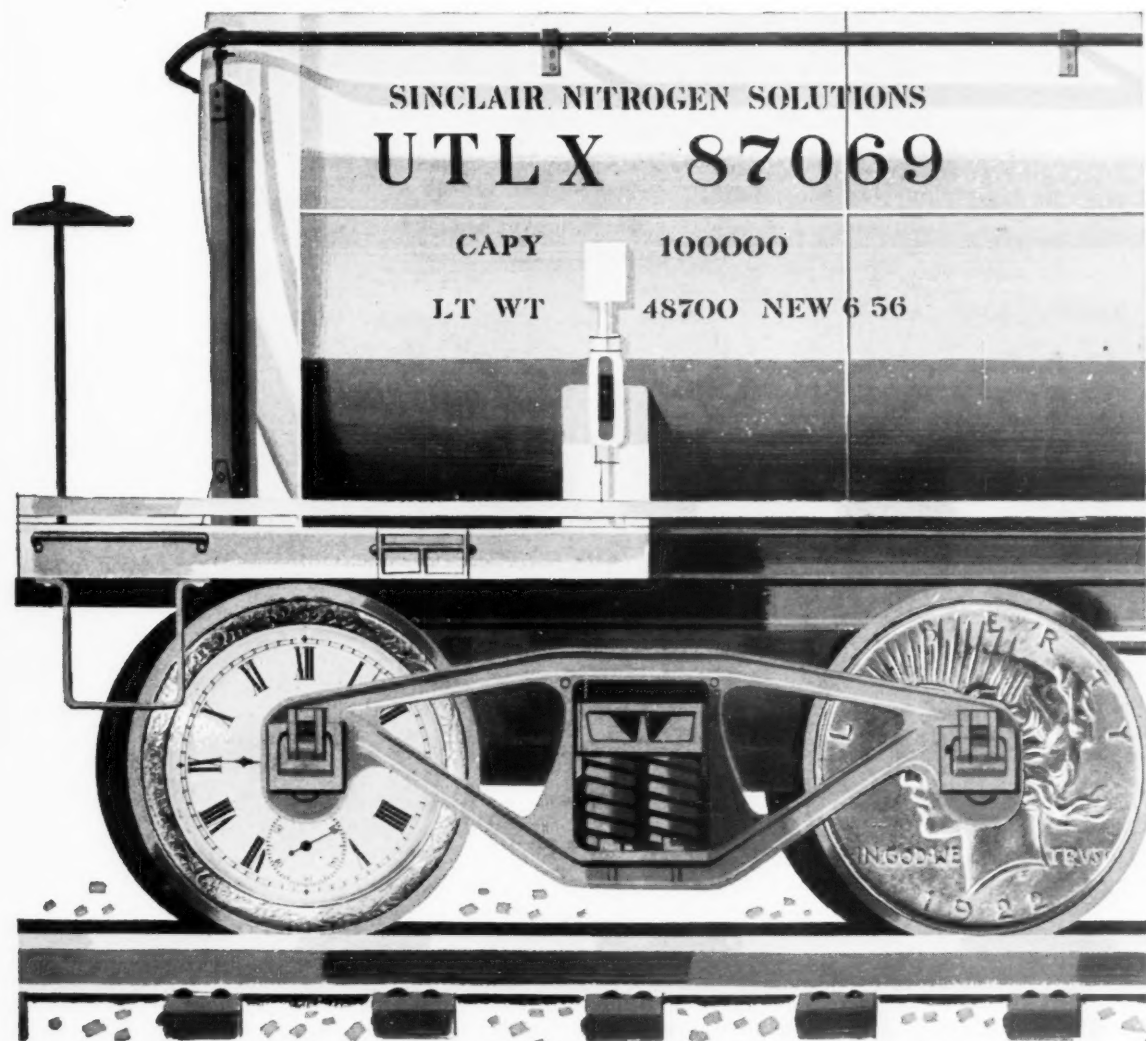
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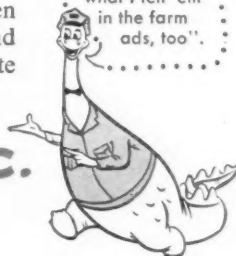
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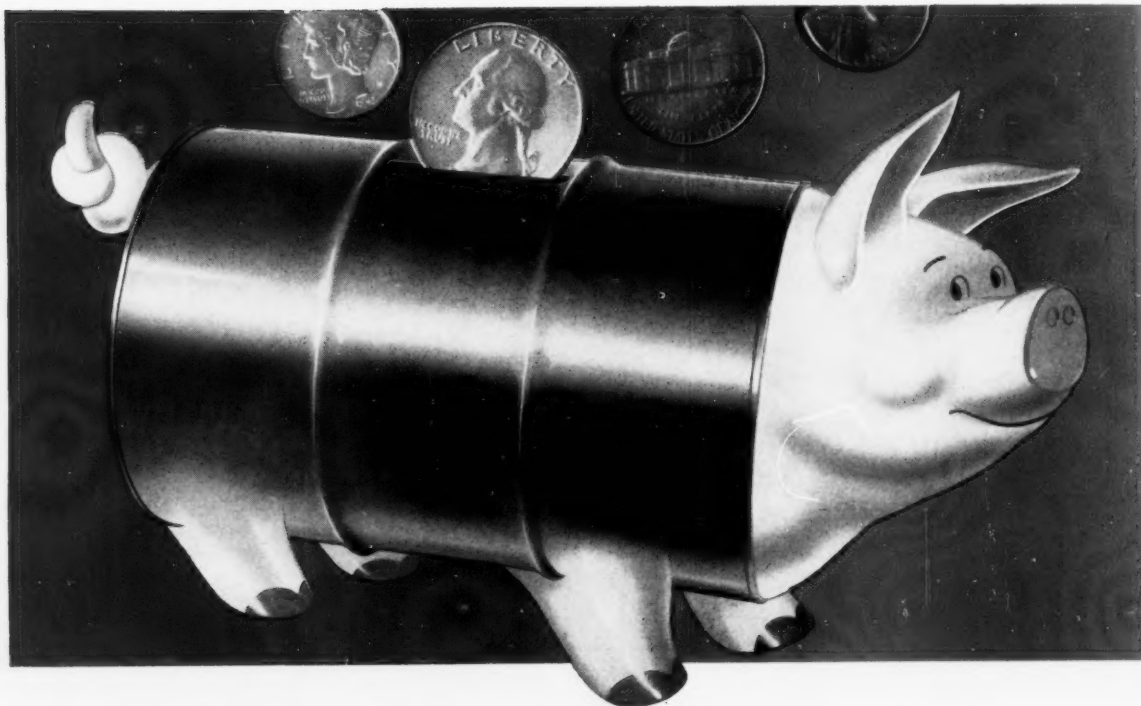
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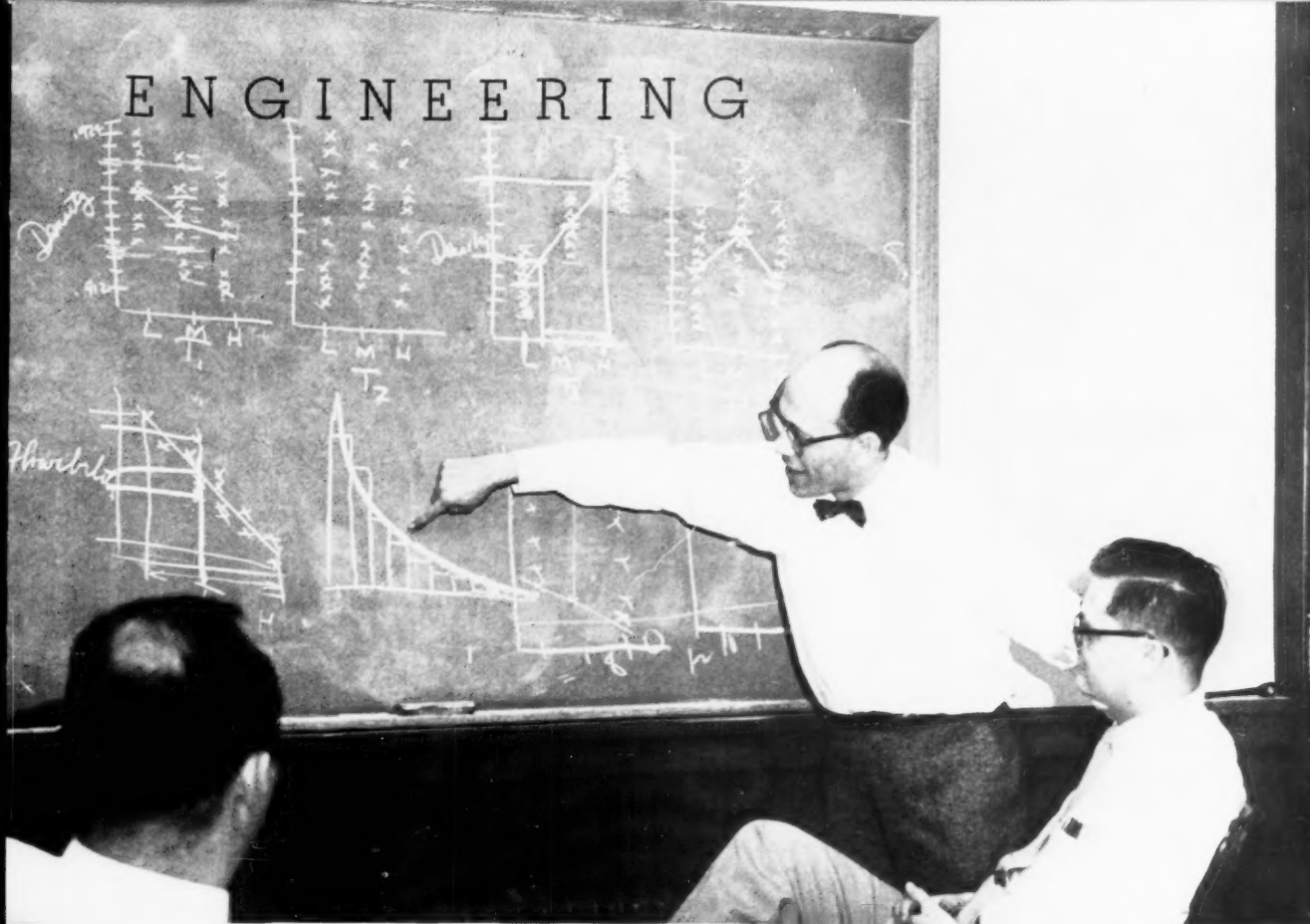
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ENGINEERING



Spencer personnel get graphic briefing on a statistical method with broad plant application.

Simple System Spotlights Vital Variables

Management men and engineers at Spencer Chemical Co. (Kansas City, Mo.) last week were evaluating the results of their first year's experience with a novel, nonmathematical, statistical technique called "random balance." Spencer, one of the first in the CPI to use the technique, finds it has a wide range of applications—from trouble-shooting to providing guides to optimum processing conditions.

Developed by F. E. Satterthwaite (Wellesley Hills, Mass.) about two years ago, and used in several industries, random balance provides speedy and simple solutions of problems involving a multitude of factors. Spencer tried it as part of a statistical-design program suggested by consultants Rath & Strong (Boston). And it has found the technique gives processing tips with statistical objectivity—not the "by-guess-and-by-golly" methods so heavily dependent on subjective experience and hunches.

Here's why Spencer is so enthusiastic about random balance:

- It promises large savings in better process control (among other applications).
- Training in the technique is relatively cheap.
- Since it's nonmathematical, technically trained people find it easy to learn, easy to impart to others, even to employees without mathematical training.
- It can be used in the plant with minimum interruption of normal operations.

Of course, random balance does not replace human judgment. As one Spencer man puts it, "There is some danger in getting enthralled with statistical methods to the point of using them in situations where judgment and experience will serve adequately."

It's a Simplifier: The main use of random balance is to simplify a complex situation, weed out the few "driv-

ing" variables from the great number that might conceivably have an effect on an operation. It can determine the effect of 20 or more variables in as few as 25 to 100 test runs.

Typical Case: Here's an actual case showing what random balance does and how it does it. Spencer's sales service lab was recently called upon to help solve a specification problem for a company that was extruding plastic pipe. The critical spec was the burst strength of the finished pipe. Seven variables in the extruding operation were considered to have a possible effect on this characteristic: feed screw speed, feed screw temperature, plastic melt temperature, water bath temperature, sizing mandrel, draw ratio and effect of reworked material.

First step in programing the experiment was to set up a table (top, p. 80) with each variable heading a column. In this case, 27 was thought



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Random Balance Experiment

Test No.	Feed Screw Speed	Feed Screw Temp.	Melt Temp.	Water Bath Temp.	Sizing Mandrel	Draw Ratio	Effect of Reworking
1	H	L	L	M	H	L	H
2	M	H	M	H	L	H	M
3	H	L	L	M	L	H	M
4	L	M	H	H	H	M	L
5	M	H	L	L	M	L	H
6	M	M	M	L	H	M	M
7	H	M	M	L	H	L	M
8	H	H	L	H	L	M	H
9	L	L	H	L	M	M	L
27	M	M	L	H	L	M	H

All possible sets of conditions are random-sampled in program.

to be a sufficient number of tests because of the relatively small number of variables. The experiment was further simplified by choosing to test each variable at only three levels: "high," "medium" and "low." (Values chosen were typical of the firm's usual operations.)

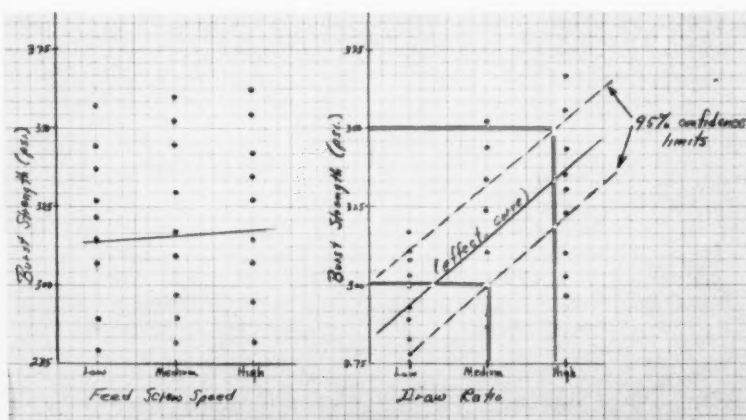
The randomization entered in the establishment of the value of each variable for each test run. Although more elaborate randomization methods could have been used, an easy one was to place 27 consecutively numbered slips of paper in a hat and draw them out one at a time.

The first nine numbers drawn were used to designate the test numbers for which each of the variables (e.g., feed screw speed) would be set at a high reading. Medium readings were assigned to runs corresponding to the

next set of nine numbers drawn at random; the nine numbers left in the hat were for "low" readings. The process was repeated for each of the six other variables, and a full program filled out (thus, in this particular case, 189 "draws" determined the conditions for all 27 tests).

The next step was simply to run the 27 tests right in the plant under the randomly selected conditions prescribed. The burst strength of the pipe produced in each run was measured and plotted in charts, showing the effect of each of the seven variables (two of which are shown below).

The "effect curve" for draw ratio—connecting the mean values of each column—had a strong upward slope, indicating a correlation between this variable and burst strength. The data for the other variables (e.g., feed



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Over Point: °C.	D 850	
Dry Point: °C.		110.2
Total Distillation Range: °C.		111.1
Paraffins, %		0.9
Acid Wash Color	D 851	Nil
Acidity	D 848	Passes
Sulfur Compounds	C 847	Nil
Copper Corrosion	D 853	Nil
	C 849	Passes

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ENGINEERING

screw speed) showed little or no correlation.

Setting Tolerances: The final step, was to set tolerances on the important variables to keep burst strength within specifications. This was done after 95% "confidence limits"—determined by regular statistical methods—were added to the charts. In this case, the specification for minimum pipe burst strength was 300 psi. on 95% of the product. The draw ratio that will ensure this percentage of good pipe was found (see chart) at the intersection of the lower confidence limit and the 300-psi. line.

Similarly, a maximum tolerance could be set (at 350 psi., for example) by using the upper confidence limit. Tolerances for other major variables were set in the same way.

Other Uses: Spencer has found many other applications for random balance. For instance, by spotting the "controlling" variables in processes, it reduces the possibility of overcontrol where operators tend to turn too many valves.

And the technique's usefulness is not confined to simple relationships. According to Satterthwaite, it can detect and evaluate nonlinear functions, discontinuities, maximums, end points, saturation effects, asymptotic effects and interactions. But random balance is not a substitute for the other methods; it's a way to get the answers in situations where others are impractical.

Getting It Going: Because of its simplicity, random balance can be quickly introduced to a company. In Spencer's case, consultants from Rath & Strong were initially assigned for full-time instruction. As the training progressed, the consultants tapered off their instruction time, and now visit Spencer every two weeks.

Depending on the size of a company's existing statistical staff, it might be able to adopt the program in even less time, using its own personnel to train plant supervisors. Statistical Engineering Institute (also at Wellesley Hills)—recently organized by Satterthwaite—offers introductory and advanced courses in the method for companies that want to get their own programs going.

As with other statistical tools, random balance needs only to be applied properly to allow process firms to start gaining savings from it.

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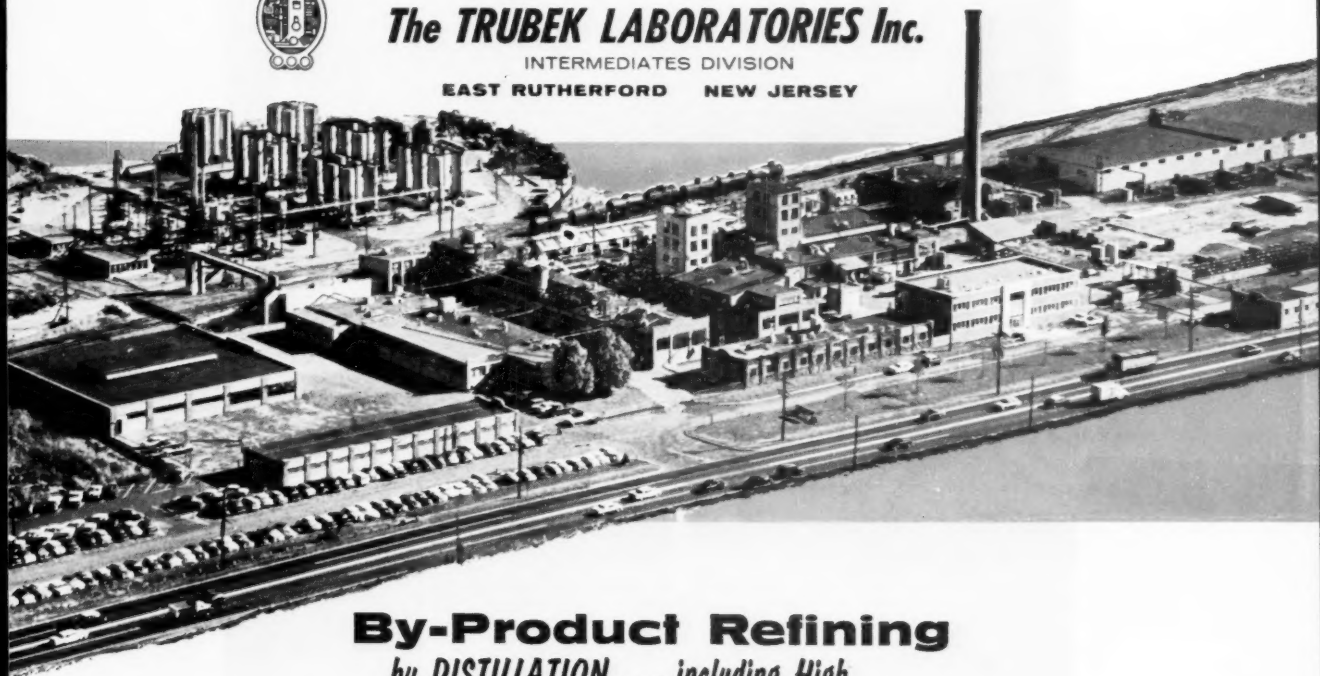
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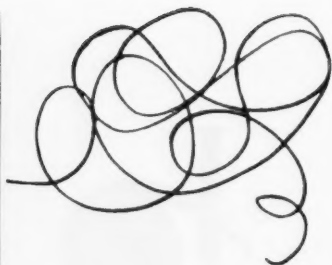


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This month in . . .

TEXTILE CHEMICALS



A NEW Editorial Feature of Textile World

A New Era in textiles is dawning! New improvements in bleaching, dyeing, mercerizing, printing, and finishing will demand broader knowledge. Mill executives and chemical-treatment personnel must keep alert to these developments—significance of their impact—in order to maintain profitable mill operation.

TEXTILE WORLD fills a vital need with a New editorial feature—"This Month in TEXTILE CHEMICALS"—beginning with the January issue. Here are a few typical items from that issue—

DYE DYNEL CONTINUOUSLY . . . Celanese Corp. of America has developed practical process for continuous dyeing of Arnel in blends and combinations with cotton and/or rayon. Cotton or rayon components can be vat-dyed continuously after the Arnel has been dyed.

TEXTILE GERM KILLERS . . . Springs Mill; J. P. Stevens; Canadian Celanese; Sears, Roebuck; and others are promoting bacteria-static finishes. Although not new, idea has been catching up in late months. At least six chemical companies are in the market with compounds that inhibit the growth of mold, mildew, and retard the formation of perspiration odors.

WATER-SOLUBLE RESINS . . . Union Carbide Chemicals Co. has developed a new group of resins that show promise in textile applications. Based on highly polymerized ethylene oxide, these materials have demonstrated their usefulness in slashing and finishing formulas.



In the mill, in the front office, TEXTILE WORLD readers—executives and chemical-treatment personnel—are reaching out for all the help they can get in new developments. They've always found more on wet processing in TEXTILE WORLD than any other publication . . . and now this big "reader extra"—covering "This Month in TEXTILE CHEMICALS."



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ENGINEERING

Compact Controller

Newest job applicant in the chemical process industries is a small, transistorized circuit, designed for control systems, proudly put on display last week by Hughes Aircraft (Los Angeles).

The device made its debut as a key part of a new control system on an automatic machine tool line—a prototype unit operating in a plant adjoining Los Angeles' International Airport. In the unit, information is transferred from a blueprint to a planning sheet, then directly to a punched tape. The tape feeds a computer, which, in turn, instructs a milling machine, a drilling machine and a boring machine.

Hughes and Kearney & Trecker Corp. (Milwaukee), which designed and produced the machines, foresee a rosy future for the system. Hughes feels that the system will enable small-lot makers to enjoy the economics of mass production.

Building Blocks: But it's the computer that's the focus of interest for chemical processors. Called the Digi-tape control system, it utilizes a building-block approach. The printed circuits and diodes require minimum space. And Hughes already has a production-version insert that requires only half the volume of prototype units.

The important feature of the building-block idea, according to Hughes researchers, is that it permits a computer customer to buy the arrangement he needs for his purpose without paying for custom engineering.

Hughes has not made an extensive study of the market for its computer in the chemical process industry. But H. L. Shoemaker, head of planning for Hughes Products (industrial systems and controls), has looked at it carefully enough to convince the company that a product line is fully justified.

So far, Hughes does not have any price figures for quotation. But Shoemaker feels that the firm can produce a unit that will be priced in the range of present "commercial" computers.

The firm has talked with chemical, petroleum and steel firms, is now working with a chemical company. "We hope," says Shoemaker, "to be able to say more about our activities in the process field six months from now."

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Unused 100 Gallon Stainless Steel Reaction Kettle, 75 PSI jkt. pressure-vacuum internal. ASME. Perry, 1415 N. 6th St., Phila., Pa.

Simpson #1 Intensive Mixer 4' dia, Stainless steel contact parts. Late model. Perry Equipment Corp., 1415 N. 6th St., Phila., Pa.

One 5 high 30" Desolventizer Toaster. Mfgd. by The French Oil Mill Machinery Co. Ideal for pilot plant or small production. Condition near new; used briefly in pilot operation. Reply to Nutrilite Products, Inc., Buena Park, California.

For Sale—"U.S. Bottlers" combination Loadomatic unscrambler and rinser, Style US-17, cap. up to 300 bpm, reconditioned. FS-7494, Chemical Week.

Yeast Dryer—Fischer rotary yeast dryer, Model 16/40, with pulverizers, elevator, still erected in plant in Eastern Pennsylvania, complete details by writing. FS-7499, Chemical Week.

For Sale—Sparkler Model 18-D-12 filter, complete with pump, filtering area approx. 18½ sq. ft., takes space 2.7 cu. ft., cap. 1000 gph. FS-7504, Chemical Week.

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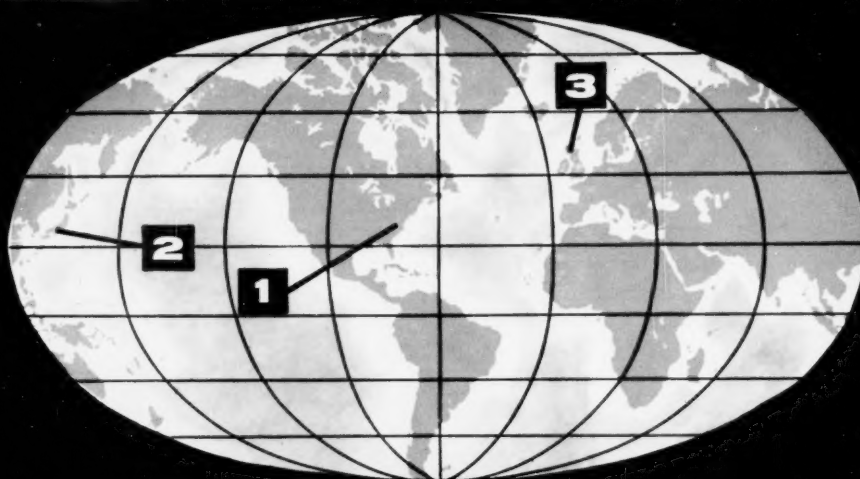
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